ThinkStation Hardware Maintenance Manual

Machine Type: 4105, 4155, 4157, 4158, 4217, 4218

lenovo

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Hardware Maintenance Manual

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Note: Before using this information and the product it supports, be sure to read the information under Appendix A “Notices” on page 255.

Twelfth Edition (March 2012)

Contents

Chapter 1. About this manual

This manual contains service and reference information for ThinkStation™ computers listed on the cover. It is intended only for trained servicers who are familiar with Lenovo® computer products.

Before servicing a Lenovo product, be sure to read the Safety Information. See Chapter 2 “Safety information” on page 3.

The Symptom-to-FRU Index and Additional Service Information chapters are not specific to any machine type and are applicable to all ThinkStation computers.

This manual includes a complete FRU part number listing for each machine type and model listed on the cover. If you have internet access, FRU part numbers are also available at:
http:/www.lenovo.com/support

Important Safety Information

Be sure to read all caution and danger statements in this book before performing any of the instructions.

Veuillez lire toutes les consignes de type DANGER et ATTENTION du présent document avant d'exécuter les instructions.

Lesen Sie unbedingt alle Hinweise vom Typ "ACHTUNG" oder "VORSICHT" in dieser Dokumentation, bevor Sie irgendwelche Vorgänge durchführen

Leggere le istruzioni introdotte da ATTENZIONE e PERICOLO presenti nel manuale prima di eseguire una qualsiasi delle istruzioni

Certifique-se de ler todas as instruções de cuidado e perigo neste manual antes de executar qualquer uma das instruções

Es importante que lea todas las declaraciones de precaución y de peligro de este manual antes de seguir las instrucciones.

تأكد من قراءة كل التحذيرات الموجودة في هذا الكتاب قبل اتباع هذه التعليمات .

执行任何说明之前，请确保已阅读本书中的所有警告和危险声明。

執行任何指示前，請確實閱讀本書中的所有警告及危險聲明。

ודאו שקראתם את כל הודעות האזהרה והסכנה במסמך זה לפני שתבצעו פעולה כלשהי.

본 사용 설명서에 기재된 내용을 실행하기 전에 모든 주의사항 및 위험사항을 숙지하십시오.

Important information about replacing RoHS compliant FRUs

RoHS, The Restriction of Hazardous Substances in Electrical and Electronic Equipment Directive (2002/95/EC) is a European Union legal requirement affecting the global electronics industry. RoHS requirements must be implemented on Lenovo products placed on the market and sold in the European Union after June 2006. Products on the market before June 2006 are not required to have RoHS compliant parts. If the parts are not compliant originally, replacement parts can also

be noncompliant, but in all cases, if the parts are compliant, the replacement parts must also be compliant.

Note: RoHS and non-RoHS FRU part numbers with the same fit and function are identified with unique FRU part numbers.

Lenovo plans to transition to RoHS compliance well before the implementation date and expects its suppliers to be ready to support Lenovo's requirements and schedule in the EU. Products sold in 2005, will contain some RoHS compliant FRUs. The following statement pertains to these products and any product Lenovo produces containing RoHS compliant parts.

RoHS compliant ThinkCentre parts have unique FRU part numbers. Before or after June, 2006, failed RoHS compliant parts must always be replaced using RoHS compliant FRUs, so only the FRUs identified as compliant in the system HMM or direct substitutions for those FRUs can be used.

Products marketed before June 2006		**Products marketed after June 2006**	
Current or original part	**Replacement FRU**	**Current or original part**	**Replacement FRU**
Non-RoHS	Can be Non-RoHS	Must be RoHS	Must be RoHS
Non-RoHS	Can be RoHS		
Non-RoHS	Can sub to RoHS		
RoHS	Must be RoHS		

Note: A direct substitution is a part with a different FRU part number that is automatically shipped by the distribution center at the time of order.

Chapter 2. Safety information

This chapter contains the safety information that you need to be familiar with before servicing a computer.

General safety

Follow these rules to ensure general safety:

- Observe good housekeeping in the area of the machines during and after maintenance.
- When lifting any heavy object:
  1. Ensure you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
  4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back. *Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.*
- Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
- Before you start the machine, ensure that other service representatives and the customer's personnel are not in a hazardous position.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
- Keep your tool case away from walk areas so that other people will not trip over it.
- Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
- Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing.
  Remember: Metal objects are good electrical conductors.
- Wear safety glasses when you are: hammering, drilling, soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
- After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
- Reinstall all covers correctly before returning the machine to the customer.

Electrical safety



CAUTION:
Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunication systems, networks, and modems before you open the server/workstation covers, unless instructed otherwise in the installation and configuration procedures.

Observe the following rules when working on electrical equipment.

Important: Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents. Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing Field Replaceable Units
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.
    Remember: Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.
    Remember: There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
  - When using testers, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

  Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.
- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, *check* that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generators

  and similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
  - Use caution; do not become a victim yourself.
  - Switch off power.
  - Send another person to get medical aid.

Voltage-selection switch

Some computers are equipped with a voltage-selection switch located near the power-cord connection point on the computer. If your computer has a voltage-selection switch, ensure that you set the switch to match the voltage available at your electrical outlet. Setting the voltage-selection switch incorrectly can cause permanent damage to the computer.

If your computer does not have a voltage-selection switch, your computer is designed to operate only at the voltage provided in the country or region where the computer was originally purchased.

If you relocate your computer to another country, be aware of the following:

- If your computer does not have a voltage-selection switch, do not connect the computer to an electrical outlet until you have verified that the voltage provided is the same as it was in the country or region where the computer was originally purchased.
- If your computer has a voltage selection switch, do not connect the computer to an electrical outlet until you have verified that the voltage-selection switch is set to match the voltage provided in that country or region.

If you are not sure of the voltage provided at your electrical outlet, contact your local electric company or refer to official Web sites or other literature for travelers to the country or region where you are located.

Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- Electrical hazards, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- Explosive hazards, such as a damaged CRT face or bulging capacitor
- Mechanical hazards, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

Checklist:

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
   a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
   b. The power cord should be the appropriate type as specified in the parts listings.
   c. Insulation must not be frayed or worn.
4. Remove the cover.

5. Check for any obvious alterations. Use good judgment as to the safety of any alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

Notes:

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:

- Keep the parts in protective packages until they are inserted into the product.
- Avoid contact with other people while handling the part.
- Wear a grounded wrist strap against your skin to eliminate static on your body.
- Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
- Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
- Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

  Note: The use of a grounding system is desirable but not required to protect against ESD damage.

  – Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
  – Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
  – Use the round ground-prong of the ac plug on ac-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Safety notices (multi-lingual translations)

The caution and danger safety notices in this section are provided in the following languages:

- English
- Arabic
- Brazilian/Portuguese
- Chinese (simplified)
- Chinese (traditional)

- French
- German
- Hebrew
- Italian
- Korean
- Spanish

DANGER

Electrical current from power, telephone and communication cables is hazardous.

To avoid a shock hazard:

- **Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.**
- **Connect all power cords to a properly wired and grounded electrical outlet.**
- **Connect to properly wired outlets any equipment that will be attached to this product.**
- **When possible, use one hand only to connect or disconnect signal cables.**
- **Never turn on any equipment when there is evidence of fire, water, or structural damage.**
- **Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.**
- **Connect and disconnect cables as described in the following tables when installing, moving, or opening covers on this product or attached devices.**

To Connect	To Disconnect
1. Turn everything OFF. 2. First, attach all cables to devices. 3. Attach signal cables to connectors. 4. Attach power cords to outlet. 5. Turn device ON.	1. Turn everything OFF. 2. First, remove power cords from outlet. 3. Remove signal cables from connectors. 4. Remove all cables from devices.

CAUTION:
When replacing the lithium battery, use only Part Number 45C1566 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of. *Do not:*

- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

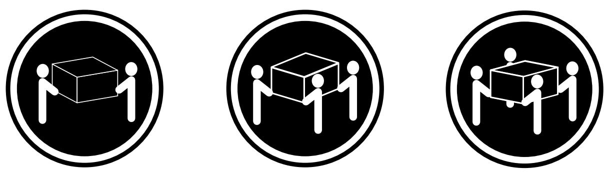
Dispose of the battery as required by local ordinances or regulations.

CAUTION:
When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

DANGER

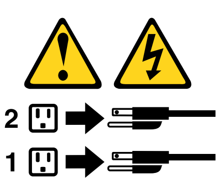
Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following: **Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.**



≥18 kg (37 lbs) ≥32 kg (70.5 lbs) ≥55 kg (121.2 lbs)

CAUTION:
Use safe practices when lifting.

CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



خـــطر

> **التيـــار الكـــهربـــي المـــوجـــود بمصـــدر الطـــاقـــة أو أجـــهزة التليفـــون أو أســـلاك الإتـــصالات يشـــكل خـــطورة.**
>
> **لـــتفادي مخـــاطـــر الصـــدمـــات الكـــهربـــائـــية:**
>
> **لا تحاول توصيل أو فصل أي أســـلاك أو القـــيام بعـــملـــيات تـــركيب أو صـــيانـــة أوإعـــادة توصـــيف لـــهذا المنتج أثـــناء وجـــود عاصـــفة كـــهربـــائـــية.**
>
> **يجـــب تـــوصـــيل كـــل أســـلاك الكـــهربـــاء فـــي مخـــارج كـــهربـــاء ذات تـــوصـــيلات أســـلاك وتـــوصـــيلات أرضـــية صحيـــحة**
> **يجـــب تـــوصـــيل أي جـــهاز ســـيتم الحـــاقه بـــهذا المـــنتج فـــي مخارج كـــهربـــاء ذات تـــوصـــيلات أســـلاك صحيحة.**
>
> **وإن أمـــكن يـــجب اســـتخدام يـــد واحـــدة فـــقط فـــي تـــوصـــيل أو فصـــل أسلاك الإشـــارة.**
>
> **لا تحـــاول تشغـــيل أي جـــهاز إذا كـــان هنـــاك أثـــر لحـــرق أو مـــياه أو تـــلف بالمكـــونـــات**
> **يجـــب فصـــل أســـلاك الكـــهربـــاء وأنـــظمة الاتصـــالات وشـــبكات الاتصـــال وأجـــهزة المـــودم الملحـــقة قـــبل فـــتح أغطية الجهاز، مـــالـــم يـــتم طـــلب خـــلاف ذلك فـــي التـــعليـــمات الخـــاصة بالتـــركيب والتـــوصـــيف.**
> **قم بتوصيل وفصل الأسلاك كما هو موضح في الجدول التالي وذلك عند القيام بعمليات التركيب أو النقل أو فتح أغطية هذا المنتج أو الأجهزة الملحقة.**

للتوصيل:	للفصل:
قم بإيقاف كل شيء.	قم بإيقاف كل شيء.
أولا، قم بتوصيل كل الأسلاك بالأجهزة.	أولا، قم بفصل كل أسلاك الكهرباء من المخرج.
قم بتوصيل أسلاك الإشارة في لموصلات.	قم بفصل أسلاك الإشارة من الموصلات.
قم بتوصيل أسلاك الكهرباء في المخارج.	قم بفصل كل الأسلاك من الأجهزة.
قم بتشغيل الجهاز.	

تنبيـــه :

عند استبدال البطارية الليثيوم، استخدم فقط رقم الجزء الخاص Part Number 45C1566
أو نوع أخر يكون على نفس مستوى الكفاءة يحدده لك المصنع.
اذا كان النظام الخاص يستخدم معه بطارية ليثيوم قم باستبدالها بنفس النوع الذي تم صناعته من خلال نفس المصنع. تحتوي البطارية على مادة الليثيوم ويمكن أن تنفجرفي حالة عدم استخدامها أو التعامل معها بطريقة صحيحة أو عند التخلص منها بطريقة خطأ.

لا تقم بـــ:

- **القاء البطارية أو غمرها في الماء**
- **تسخينها أعلى من ١٠٠ درجة مئوية°و(٢١٢ ° فهرنهيت)**
- **بتصليحها أو فكها**

تخلص من البطارية طبقا للقانون أو النظام المحلي .

تنبيـــه :
أثناء تركيب منتجات ليزر (مثل CD-ROMsأو وحدة تشغيل DVDأو أجهزة **Fiber Optic** أو وحدات الارسال) يجب مراعاة الآتي:

لا تنزع الأغطية. قد ينتج عن نزع أغطية منتج الليزر انفجار أشعة الليزر شديدة الخطورة.
لا يوجد أجزاء يمكن تغييرها داخل الجهاز. قد ينتج عن استخدام تحكمات أو تعديلات أو عمل أي تصرفات أخرى تخالف ما هو محددا هنا الى انفجار أشعة شديدة الخطورة.

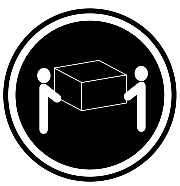


خطـر

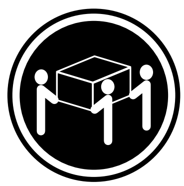
تحتوي بعض منتجات الليزر على الفئة داويد ليزر مدمج من الفئة Class 3A أوClass 3B. يجب مراعاة الآتي .

أشعة الليزر عند الفتح. لا تحدق الى الاشعاع و لا تنظر اليه مباشرة بواسطة أي أجهزة مرئية وتجنب التعرض المباشر للاشعاع .

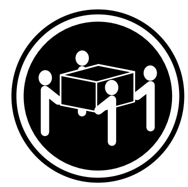




≥18 kg (37 lbs)



≥32 kg (70.5 lbs)

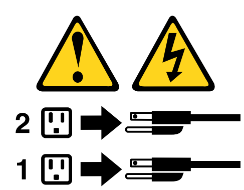


≥55 kg (121.2 lbs)

تنبيه :
يجب استخدام ممارسات آمنة عند الرفع



تنبيـــه :
لا يقم زر التحكم في التشغيل الموجود على الجهاز والمفتاح الكهربائي الموجود على لوحة التحكم بايقاف التيار الكهربائي المار بالجهاز. قد يكون للجهاز أكثر من سلك كهربائي واحد. لايقاف التيار الكهربائي المار بالجهاز، تأكد من فصل جميع أسلاك الكهرباء من مصدر الكهرباء .





PERIGO

A corrente elétrica proveniente de cabos de alimentação, de telefone e de comunicações é perigosa.

Para evitar risco de choque elétrico:

- Não conecte nem desconecte nenhum cabo ou execute instalação, manutenção ou reconfiguração deste produto durante uma tempestade com raios.
- Conecte todos os cabos de alimentação a tomadas elétricas corretamente instaladas e aterradas.
- Todo equipamento que for conectado a este produto deve ser conectado a tomadas corretamente instaladas.
- Quando possível, utilize apenas uma das mãos para conectar ou desconectar cabos de sinal.
- Nunca ligue nenhum equipamento quando houver evidência de fogo, água ou danos estruturais.
- Antes de abrir tampas de dispositivos, desconecte cabos de alimentação, sistemas de telecomunicação, redes e modems conectados, a menos que especificado de maneira diferente nos procedimentos de instalação e configuração.
- Conecte e desconecte os cabos conforme descrito na tabela apresentada a seguir ao instalar, mover ou abrir tampas deste produto ou de dispositivos conectados.

Para Conectar:	**Para Desconectar:**
1. DESLIGUE Tudo.	1. DESLIGUE Tudo.
2. Primeiramente, conecte todos os cabos aos dispositivos.	2. Primeiramente, remova os cabos de alimentação das tomadas.
3. Conecte os cabos de sinal aos conectores.	3. Remova os cabos de sinal dos conectores.
4. Conecte os cabos de alimentação às tomadas.	4. Remova todos os cabos dos dispositivos.
5. LIGUE os dispositivos.	

CUIDADO:

Ao substituir a bateria de lítio, utilize apenas uma bateria com Número de Peça 45C1566 ou um tipo de bateria equivalente recomendado pelo Se o seu sistema possui um módulo com uma bateria de lítio, substitua-o apenas por um módulo do mesmo tipo e do mesmo fabricante. A bateria contém lítio e pode explodir se não for utilizada, manuseada ou descartada de maneira correta.

Não:

- Jogue ou coloque na água
- Aqueça a mais de 100°C (212°F)
- Conserte nem desmonte

Descarte a bateria conforme requerido pelas leis ou regulamentos locais.

PRECAUCIÓN:

Quando produtos a laser (como unidades de CD-ROMs, unidades de DVD-ROM, dispositivos de fibra ótica ou transmissores) estiverem instalados, observe o seguinte:

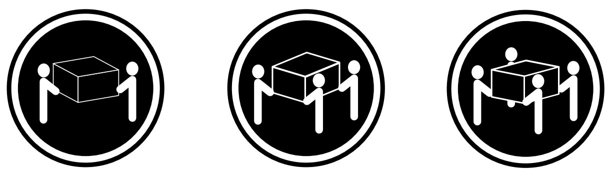
- Não remova as tampas. A remoção das tampas de um produto a laser pode resultar em exposição prejudicial à radiação de laser. Não existem peças que podem ser consertadas no interior do dispositivo.
- A utilização de controles ou ajustes ou a execução de procedimentos diferentes dos especificados aqui pode resultar em exposição prejudicial à radiação.

PERIGO

Alguns produtos a laser contêm diodo de laser integrado da Classe 3A ou da Classe 3B. Observe o seguinte:

Radiação a laser quando aberto. Não olhe diretamente para o feixe a olho nu ou com instrumentos ópticos e evite exposição direta ao feixe.





≥18 kg (37 lbs) ≥32 kg (70.5 lbs) ≥55 kg (121.2 lbs)

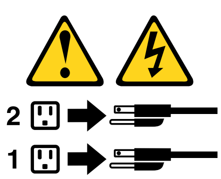
CUIDADO:

Utilize procedimentos de segurança para levantar equipamentos.



CUIDADO:

O botão de controle de alimentação do dispositivo e o botão para ligar/desligar da fonte de alimentação não desligam a corrente elétrica fornecida ao dispositivo. O dispositivo também pode ter mais de um cabo de alimentação. Para remover toda a corrente elétrica do dispositivo, assegure que todos os cabos de alimentação estejam desconectados da fonte de alimentação.





危险

电源、电话和通信电缆中的电流是危险的。

为避免电击危险：

- 请勿在雷电期间连接或断开任何电缆的连接，或者对本产品进行安装、维护或重新配置。
- 将所有电源线连接到正确连线和妥善接地的电源插座。
- 将所有要连接到该产品的设备连接到正确连线的插座。
- 如果可能，请仅使用一只手来连接或断开信号电缆的连接。
- 切勿在有火、水、结构损坏迹象的情况下开启任何设备。
- 在打开设备外盖之前请断开已连接的电源线、远程通信系统、网络和调制解调器，除非在安装和配置过程中另有说明。
- 当安装、移动或打开该产品或连接设备的外盖时，请按照下表所述来连接或断开电缆的连接。

要连接	要断开连接
1. 切断所有电源。 2. 首先将所有电缆连接到设备。 3. 将信号电缆连接到接口。 4. 将电源线连接到插座。 5. 开启设备。	1. 切断所有电源。 2. 首先从插座上拔出电源线。 3. 从接口上拔出信号电缆。 4. 从设备上拔出所有电缆。

警告：
更换锂电池时，请仅使用部件号为 45C1566 的电池或制造商推荐的同类电池。如果您的系统有包含锂电池的模块，请仅使用同一制造商生产的相同模块类型来替换该模块。该电池中含有锂，如果使用、操作或处理不当，可能会发生爆炸。

切勿：

- 投入或浸入水中
- 加热到 100℃（212℉）以上
- 维修或拆卸

请按照当地法令或条例的要求处理电池。

警告：
安装激光产品（例如 CD-ROM、DVD-ROM 驱动器、光纤设备或发射设备）时，请注意以下声明：

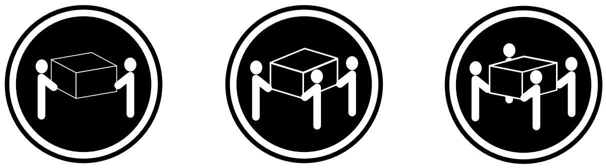
- 请勿卸下外盖。卸下激光产品的外盖可能导致遭受激光辐射的危险。该设备内没有可维修的部件。
- 如果不按照此处指定的过程进行控制、调整或操作，则有可能导致遭受辐射的危险。

危险

某些激光产品包含嵌入式 3A 类或 3B 类激光二极管。请注意以下声明：

打开后有激光辐射。请勿注视光束，请勿直接用光学仪器查看，并请避免直接暴露在光束中。



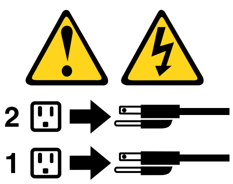


≥18 千克（37 磅） ≥32 千克（70.5 磅） ≥55 千克（121.2 磅）

警告：
抬起时请采取安全措施。



警告：
设备上的电源控制按钮和电源上的电源开关不会切断供给该设备的电流。该设备还可能有多条电源线。要切断该设备的所有电流，请确保所有电源线都与电源断开连接。





危險

電源、電話及通訊纜線上的電流都具有危險性。
若要避免觸電危險：
- 請勿在雷雨期間，連接或拔除纜線、執行安裝、維護或重新配置本產品。
- 將所有電源線連接到正確配線及接地的電源插座。
- 任何與本產品連接的設備都必須連接到配線妥當的電源插座。
- 請盡可能用單手連接或拔除信號線。
- 發生火災、水災或結構損害時，絕對不要開啟任何設備。
- 除非在安裝及配置程序中另有指示，否則在開啟裝置機蓋之前，請拔掉連接的電源線、電信系統、網路及數據機。
- 安裝、移動或開啟本產品或附屬裝置的機蓋時，請遵循下列說明連接及拔掉纜線。

連線	切斷連線
1. 關閉所有開關。 2. 首先，連接所有接線到裝置。 3. 連接信號線到接頭。 4. 連接電源線到插座。 5. 開啟裝置。	1. 關閉所有開關。 2. 首先，拔掉插座上的電源線。 3. 拔掉接頭上的信號線。 4. 拔掉裝置上所有接線。

警告：
更換鋰電池時，請僅使用產品編號 **45C1566** 或製造商所建議的同類型電池。
如果您的系統中含有鋰電池模組，請僅使用同一家製造商所生產的相同模組進行更換。
如果未以正確方式使用、處理或棄置含鋰的電池，會有爆炸的危險。
請勿：

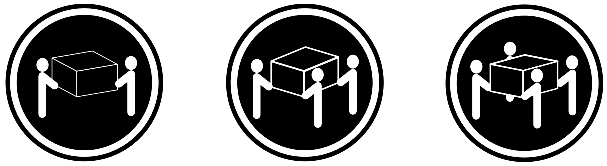
- 沾溼或浸入水中
- 置於 **100°C (212°F)** 以上的高溫環境
- 修理或拆開

請按照各地區有關廢棄電池的法令和規定處理舊電池。

警告：
- 請勿移除機蓋。移除雷射產品的機蓋，可能會導致暴露在危險的雷射輻射中。裝置內部並無可自行維修的零件。
- 利用或執行非本文中所指定的控制、調整及執行程序，可能會導致危險的輻射外洩。

危險

部分雷射產品含有內嵌式 **Class 3A** 或 **Class 3B** 雷射二極體。請注意下列事項：
在開啟光碟機時，會發生雷射輻射。請勿直視光束或用光學儀器直接檢視，並避免直接暴露在光束中。

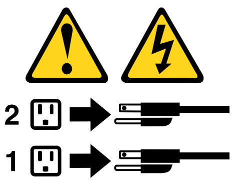


≥ 18 公斤（37 磅） ≥ 32 公斤（70.5 磅） ≥ 55 公斤（121.2 磅）

警告：
搬運時請注意安全。



警告：
裝置上的電源控制按鈕及電源供應器上的電源開關，無法關閉裝置所產生的電流。
該裝置可能有多條電源線。若要除去裝置流出的所有電流，請確認已切斷所有電源線的電源。





DANGER

Le courant électrique provenant de l'alimentation, du téléphone et des câbles de transmission peut présenter un danger.

Pour éviter tout risque de choc électrique :

- Ne manipulez aucun câble et n'effectuez aucune opération d'installation, d'entretien ou de reconfiguration de ce produit au cours d'un orage.
- Branchez tous les cordons d'alimentation sur un socle de prise de courant correctement câblé et mis à la terre.
- Branchez sur des socles de prise de courant correctement câblés tout équipement connecté à ce produit.
- Lorsque cela est possible, n'utilisez qu'une seule main pour connecter ou déconnecter les câbles d'interface.
- Ne mettez jamais un équipement sous tension en cas d'incendie ou d'inondation, ou en présence de dommages matériels.
- Avant de retirer les carters de l'unité, mettez celle-ci hors tension et déconnectez ses cordons d'alimentation, ainsi que les câbles qui la relient aux réseaux, aux systèmes de télécommunication et aux modems (sauf instruction contraire mentionnée dans les procédures d'installation et de configuration).
- Lorsque vous installez, que vous déplacez, ou que vous manipulez le présent produit ou des périphériques qui lui sont raccordés, reportez-vous aux instructions ci-dessous pour connecter et déconnecter les différents cordons.

Connexion	Déconnexion
1. Mettez les unités HORS TENSION. 2. Commencez par brancher tous les cordons sur les unités. 3. Branchez les câbles d'interface sur des connecteurs. 4. Branchez les cordons d'alimentation sur des prises. 5. Mettez les unités SOUS TENSION.	1. Mettez les unités HORS TENSION. 2. Débranchez les cordons d'alimentation des prises. 3. Débranchez les câbles d'interface des connecteurs. 4. Débranchez tous les câbles des unités.

ATTENTION:

Remplacer la pile au lithium usagée par une pile de référence identique exclusivement, (référence 45C1566), ou suivre les instructions du fabricant qui en définit les équivalences. Si votre système est doté d'un module contenant une pile au lithium, vous devez le remplacer uniquement par un module identique, produit par le même fabricant. La pile contient du lithium et peut exploser en cas de mauvaise utilisation, de mauvaise manipulation ou de mise au rebut inappropriée.

Ne pas :

- **la jeter à l'eau,**
- **l'exposer à des températures supérieures à 100°C,**
- **chercher à la réparer ou à la démonter.**

Ne pas mettre la pile à la poubelle. Pour la mise au rebut, se reporter à la réglementation en vigueur.

ATTENTION:

Si des produits à laser (tels que des unités de CD-ROM, de DVD-ROM, des unités à fibres optiques, ou des émetteurs) sont installés, prenez connaissance des informations suivantes :

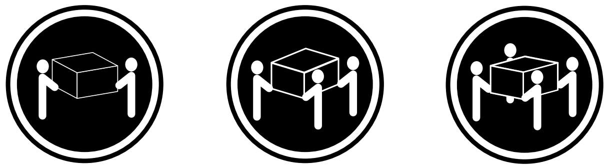
- **Ne retirez pas le carter. En ouvrant l'unité de CD-ROM ou de DVD-ROM, vous vous exposez au rayonnement dangereux du laser. Aucune pièce de l'unité n'est réparable.**
- **Pour éviter tout risque d'exposition au rayon laser, respectez les consignes de réglage et d'utilisation des commandes, ainsi que les procédures décrites dans le présent manuel.**

DANGER

Certains produits à laser contiennent une diode à laser intégrée de classe 3A ou 3B. Prenez connaissance des informations suivantes:

Rayonnement laser lorsque le carter est ouvert. Evitez toute expositiondirecte au rayon laser. Evitez de regarder fixement le faisceau ou del'observer à l'aide d'instruments optiques.





≥18 kg (37 lbs) ≥32 kg (70.5 lbs) ≥55 kg (121.2 lbs)

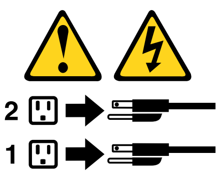
ATTENTION:

Soulevez la machine avec précaution.



ATTENTION:

L'interrupteur de contrôle d'alimentation de l'unité et l'interrupteur dubloc d'alimentation ne coupent pas le courant électrique alimentantl'unité. En outre, le système peut être équipé de plusieurs cordonsd'alimentation. Pour mettre l'unité hors tension, vous devez déconnectertous les cordons de la source d'alimentation.





VORSICHT

An Netz-, Telefon- und Datenleitungen können gefährliche Spannungen anliegen.

Aus Sicherheitsgründen:

- **Bei Gewitter an diesem Gerät keine Kabel anschließen oder lösen. Ferner keine Installations-, Wartungs- oder Rekonfigurationsarbeiten durchführen.**
- **Gerät nur an eine Schutzkontaktsteckdose mit ordnungsgemäß geerdetem Schutzkontakt anschließen.**
- **Alle angeschlossenen Geräte ebenfalls an Schutzkontaktsteckdosen mit ordnungsgemäß geerdetem Schutzkontakt anschließen.**
- **Die Signalkabel nach Möglichkeit einhändig anschließen oder lösen, um einen Stromschlag durch Berühren von Oberflächen mit unterschiedlichem elektrischem Potenzial zu vermeiden.**
- **Geräte niemals einschalten, wenn Hinweise auf Feuer, Wasser oder Gebäudeschäden vorliegen.**

- **Die Verbindung zu den angeschlossenen Netzkabeln, Telekommunikationssystemen, Netzwerken und Modems ist vor dem Öffnen des Gehäuses zu unterbrechen, sofern in den Installations- und Konfigurationsprozeduren keine anders lautenden Anweisungen enthalten sind.**
- **Zum Installieren, Transportieren und Öffnen der Abdeckungen des Computers oder der angeschlossenen Einheiten die Kabel gemäß der folgenden Tabelle anschließen und abziehen.**

Zum Anschließen der Kabel gehen Sie wie folgt vor	Zum Abziehen der Kabel gehen Sie wie folgt vor
1. Schalten Sie alle Einheiten AUS. 2. Schließen Sie erst alle Kabel an die Einheiten an. 3. Schließen Sie die Signalkabel an die Buchsen an. 4. Schließen Sie die Netzkabel an die Steckdose an. 5. Schalten Sie die Einheit EIN.	1. Schalten Sie alle Einheiten AUS. 2. Ziehen Sie zuerst alle Netzkabel aus den Netzsteckdosen. 3. Ziehen Sie die Signalkabel aus den Buchsen. 4. Ziehen Sie alle Kabel von den Einheiten ab.

CAUTION:

Eine verbrauchte Lithiumbatterie nur durch eine Batterie mit der Teilenummer 45C1566 oder eine gleichwertige, vom Hersteller empfohlene Batterie ersetzen. Enthält das System ein Modul mit einer Lithiumbatterie, dieses nur durch ein Modul desselben Typs und von demselben Hersteller ersetzen. Die Batterie enthält Lithium und kann bei unsachgemäßer Verwendung, Handhabung oder Entsorgung explodieren.

Die Batterie nicht:

- mit Wasser in Berührung bringen.
- über 100 C erhitzen.
- reparieren oder zerlegen.

Die örtlichen Bestimmungen für die Entsorgung von Sondermüll beachten.

ACHTUNG:

Bei der Installation von Lasergeräten (wie CD-ROM-Laufwerken, DVD- aufwerken, Einheiten mit Lichtwellenleitertechnik oder Sendern) Folgendes beachten:

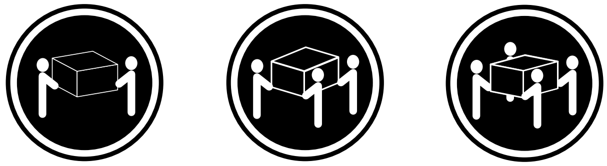
- **Die Abdeckungen nicht entfernen. Durch Entfernen der Abdeckungen des Lasergeräts können gefährliche Laserstrahlungen freigesetzt werden. Das Gerät enthält keine zu wartenden Teile.**
- **Werden Steuerelemente, Einstellungen oder Durchführungen von Prozeduren anders als hier angegeben verwendet, kann gefährliche Laserstrahlung auftreten.**

VORSICHT

Einige Lasergeräte enthalten eine Laserdiode der Klasse 3A oder 3B. Beachten Sie Folgendes:

Laserstrahlung bei geöffneter Verkleidung. Nicht in den Strahl blicken. Keine Lupen oder Spiegel verwenden. Strahlungsbereich meiden.





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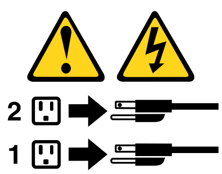
ACHTUNG:

Arbeitsschutzrichtlinien beim Anheben der Maschine beachten.



ACHTUNG:

Mit dem Netzschalter an der Einheit und am Netzteil wird die Stromversorgung für die Einheit nicht unterbrochen. Die Einheit kann auch mit mehreren Netzkabeln ausgestattet sein. Um die Stromversorgung für die Einheit vollständig zu unterbrechen, müssen alle zum Gerät führenden Netzkabel vom Netz getrennt werden.





סכנה

זרם חשמלי המועבר בכבלי חשמל, טלפון ותקשורת הוא מסוכן.

כדי להימנע מסכנת התחשמלות:

- אל תחברו או תנתקו כבלים, ואל תבצעו פעולת התקנה, תחזוקה או שינוי תצורה במוצר זה במהלך סופת ברקים.
- חברו את כל כבלי החשמל לשקע חשמל מחווט ומוארק כהלכה.
- חברו כל ציוד שיחובר למוצר זה לשקעי חשמל מחווטים כהלכה.
- במידת האפשר, השתמשו ביד אחת בלבד לחיבור או לניתוק של כבלי אותות.
- לעולם אל תפעילו ציוד כלשהו כאשר יש עדות לנזק מבני או לנזק כתוצאה מאש או ממים.
- נתקו את כבלי החשמל, מערכות התקשורת, התקני הרשת והמודמים המחוברים לפני פתיחת כיסויי ההתקן, אלא אם הליכי ההתקנה וקביעת התצורה מורים אחרת.
- בעת התקנה, העברה או פתיחת כיסויים במוצר זה או בהתקנים המחוברים, חברו ונתקו את הכבלים כמתואר בטבלה שלהלן.

כדי לחבר	כדי לנתק
1. כבו הכל. 2. ראשית, חברו את כל הכבלים להתקנים. 3. חברו את כבלי האותות למחברים. 4. חברו את כבלי החשמל לשקעים. 5. הפעילו את ההתקן.	1. כבו הכל. 2. ראשית, נתקו את כבלי החשמל מהשקעים. 3. נתקו את כבלי האותות מהמחברים. 4. הסירו את כל הכבלים מההתקנים.

זהירות:
בעת החלפת סוללת הליתיום, השתמשו רק בסוללה בעלת מק"ט 45C1566 או בסוג תואם שהומלץ על ידי היצרן.
אם המערכת כוללת מודול המכיל סוללת ליתיום, החליפו אותו רק במודול מאותו סוג ומתוצרת אותו יצרן.
הסוללה מכילה ליתיום, ועלולה להתפוצץ אם לא משתמשים ומטפלים בה או משליכים אותה כיאות.

לעולם:

- אל תטבלו במים
- אל תחממו לטמפרטורה הגבוהה מ-$100^{O}C$ ($212^{O}F$)
- אל תתקנו או תפרקו

השליכו את הסוללה כנדרש לפי התקנות והחוקים המקומיים.

זהירות:
בעת התקנת מוצרי לייזר (כגון כונני תקליטורים ו-DVD, התקני סיב אופטי או משדרים), שימו לב לאזהרות הבאות:

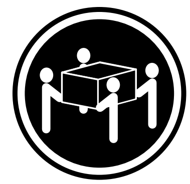
- אל תסירו את הכיסויים. הסרת הכיסויים של מוצר הלייזר עלולה לגרום לחשיפה לקרינת לייזר מסוכנת. אין חלקים ברי טיפול בתוך ההתקן.
- שינויים, שימוש בבקרות או ביצוע הליכים אחרים מאלה המתוארים כאן, עלולים לגרום לחשיפה לקרינה מסוכנת.

סכנה

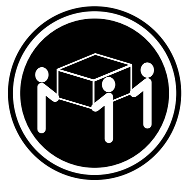
מוצרי לייזר מסוימים מכילים דיודת לייזר מסוג Class 3A או Class 3B. שימו לב לאזהרה הבאה:

כאשר הוא פתוח, המוצר פולט קרינת לייזר. אל תביטו ישירות בקרן, אל תביטו ישירות בעזרת ציוד אופטי, והימנעו מחשיפה לקרן.

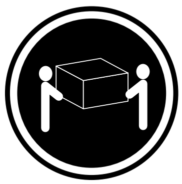




≥ 55 ק"ג (121.2 ליב')



≥ 32 ק"ג (70.5 ליב')

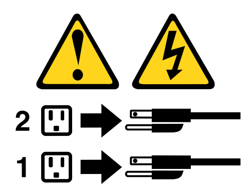


≥ 18 ק"ג (37 ליב')

זהירות:
השתמשו בהליכים
הנאותים בעת
הרמת הציוד.



זהירות:
לחצן ההפעלה של ההתקן ומתג ההפעלה של ספק החשמל אינם מפסיקים את זרם החשמל המסופק להתקן. בנוסף, ההתקן עשוי לכלול יותר מכבל חשמל אחד. כדי לסלק את כל הזרם החשמלי מההתקן, ודאו שכל כבלי החשמל מנותקים ממקור החשמל.





PERICOLO

La corrente elettrica proveniente dai cavi di alimentazione, del telefono e di comunicazione può essere pericolosa.

Per evitare il rischio di scosse elettriche:

- **Non collegare o scollegare qualsiasi cavo oppure effettuare l'installazione, la manutenzione o la riconfigurazione del prodotto durante un temporale.**
- **Collegare tutti i fili elettrici a una presa di alimentazione correttamente cablata e dotata di messa a terra.**
- **Collegare alle prese elettriche appropriate tutte le apparecchiature che verranno utilizzate per questo prodotto.**

- **Se possibile, utilizzare solo una mano per collegare o scollegare i cavi di segnale.**
- **Non accendere assolutamente apparecchiature in presenza di incendi, perdite d'acqua o danno strutturale.**
- **Scollegare i cavi di alimentazione, i sistemi di telecomunicazione, le reti e il modem prima di aprire i coperchi del dispositivo, salvo istruzioni contrarie relative alle procedure di installazione e configurazione.**
- **Collegare e scollegare i cavi come descritto nella seguente tabella quando vengono effettuate operazioni di installazione, spostamento o apertura dei coperchi di questo prodotto o delle unità collegate.**

Per collegarsi	Per scollegarsi
1. SPEGNERE le apparecchiature. 2. Innanzitutto, collegare tutti i cavi alle unità. 3. Collegare i cavi di segnale ai connettori. 4. Collegare i cavi di alimentazione alla presa. 5. Accendere l'unità.	1. SPEGNERE le apparecchiature. 2. Innanzitutto, rimuovere i cavi di alimentazione dalla presa. 3. Rimuovere i cavi di segnale dai connettori. 4. Rimuovere tutti i cavi dalle unità.

ATTENZIONE:

Quando si sostituisce la batteria al litio, utilizzare solo il Numero parte 45C1566 o un tipo di batteria equivalente consigliato dal produttore. Se sul sistema è presente un modulo che contiene una batteria al litio, sostituirlo solo con un tipo di modulo dello stesso tipo della stessa casa di produzione. La batteria contiene litio e può esplodere se usata, maneggiata o smaltita in modo non corretto.

Non:

- **Gettare o immergere la batteria nell'acqua**
- **Riscaldarla ad una temperatura superiore ai 100 gradi C (212 gradi F)**
- **Smontarla, ricaricarla o tentare di ripararla**

Le batterie usate vanno smaltite in accordo alla normativa in vigore (DPR 915/82 e successive disposizioni e disposizioni locali).

ATTENZIONE:

Quando vengono installati prodotti laser (quali CD-ROM, unità DVD-ROM, unità a fibre ottiche o trasmittenti), tener presente quanto segue:

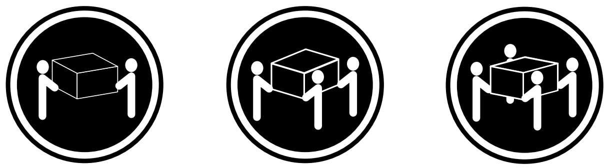
- **Non rimuovere gli sportelli. L'apertura di un'unità laser può determinare l'esposizione a radiazioni laser pericolose. All'interno dell'unità non vi sono parti su cui effettuare l'assistenza tecnica.**
- **L'utilizzo di controlli, regolazioni o l'esecuzione di procedure non descritti nel presente manuale possono provocare l'esposizione a radiazioni pericolose.**

PERICOLO

Alcune unità laser contengono un diodo laser di Classe 3A o Classe 3B. Tener presente quanto segue:

Aprendo l'unità vengono emesse radiazioni laser. Non fissare il fascio, non guardarlo direttamente con strumenti ottici ed evitare l'esposizione al fascio.





≥18 kg (37 lbs) ≥32 kg (70.5 lbs) ≥55 kg (121.2 lbs)

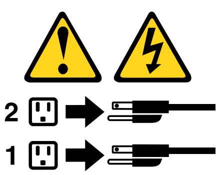
ATTENZIONE:

Prestare attenzione nel sollevare l'apparecchiatura.



ATTENZIONE:

Il pulsante di controllo dell'alimentazione presente sull'unità e l'interruttore dell'alimentatore non disattivano l'alimentazione corrente fornita all'unità. E' possibile che l'unità disponga di più cavi di alimentazione. Per disattivare l'alimentazione dall'unità, accertarsi che tutti i cavi di alimentazione siano scollegati dalla fonte di alimentazione.





위험

전원, 전화, 통신 케이블의 전류는 위험합니다.

감전의 위험을 피하려면 다음과 같이 하십시오.

- 번개가 치는 날에는 케이블을 연결 또는 분리하거나 본 제품을 설치, 보수, 재구성하지 마십시오.

- 모든 전원 코드는 올바르게 접지된 전기 콘센트에 연결하십시오.

- 본 제품에 연결될 장치는 올바르게 배선된 콘센트에 연결하십시오.

- 신호 케이블을 연결 또는 분리할 때 가능하면 한 손만을 사용하십시오.

- 불 또는 물로 인한 손상이나 구조적인 손상이 있을 경우 장치의 전원을 절대 켜지 마십시오.

- 설치 및 구성 과정에 별도의 지시 사항이 없는 경우, 장치의 덮개를 열기 전에 연결된 전원 코드, 원격 통신 시스템, 네트워크, 모뎀을 분리하십시오.

- 본 제품이나 연결된 장치를 설치, 이동하거나 덮개를 열 때 다음 표와 같은 순서로 케이블을 연결하거나 분리하십시오.

연결할 때:	분리할 때:
1. 모든 장치의 전원을 끄십시오. 2. 먼저 모든 케이블을 장치에 연결하십시오. 3. 커넥터에 신호 케이블을 연결하십시오. 4. 콘센트에 전원 코드를 연결하십시오. 5. 장치의 전원을 켜십시오.	1. 모든 장치의 전원을 끄십시오. 2. 먼저 콘센트에서 전원 코드를 분리하십시오. 3. 커넥터에서 신호 케이블을 분리하십시오. 4. 장치에서 모든 케이블을 분리하십시오.

주의:
배터리를 교환할 때는 Part Number 45C1566 또는 제조업체에서 지정한 동일한 종류의 제품을 사용하십시오. 사용자의 시스템이 리튬 배터리를 포함하는 모듈일 경우, 동일한 제조업체에서 동일한 모듈 유형으로 생산된 제품으로 교체하십시오. 배터리에는 리튬이 함유되어 있어 잘못 사용, 취급 또는 폐기할 경우 폭발의 위험이 있습니다.

사고를 방지하려면 다음 사항을 준수하십시오.

- 배터리를 물 속에 던지거나 침수시키지 마십시오.

- 100℃(212°F) 이상 가열하지 마십시오.

- 수리하거나 분해하지 마십시오.

배터리를 폐기할 때는 법령 또는 회사의 안전 수칙에 따라 폐기하십시오.

주의:
CD-ROM, DVD-ROM 장치, 광섬유 장치 또는 송신 장치와 같은 레이저 제품을 설치할 때, 다음과 같은 취급 주의사항을 참고하십시오.

– 덮개를 열지 마십시오. 덮개를 열면 레이저 복사 에너지에 노출될 위험이 있습니다. 장치 내부에는 사용자가 조정하거나 수리할 수 있는 부품이 없습니다.

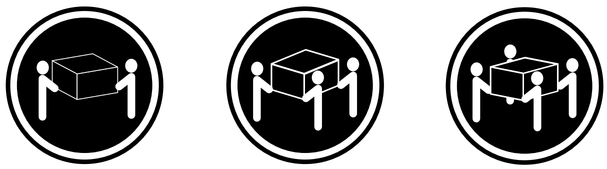
– 규정된 것 이외의 절차 수행, 제어 조정 등의 행위로 인해 해로운 레이저 복사에 노출될 수 있습니다.

위험

일부 장비에는 임베디드 클래스 3A 또는 클래스 3B 레이저 다이오드가 있습니다. 다음 주의사항에 유의하십시오.

드라이브가 열리면 레이저 복사 에너지가 방출됩니다. 광선이 눈에 직접 쏘이지 않도록 하십시오. 나안 또는 광학 기구를 착용한 상태에서 광선을 직접 바라보지 않도록 하십시오.



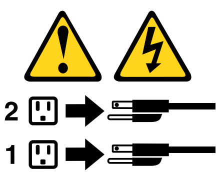


≥18 kg (37 lbs) ≥32 kg (70.5 lbs) ≥55 kg (121.2 lbs)

주의:
제품을 들어 올릴 때
안전 규제를 따르십시오.



주의:
장치의 전원 제어 버튼 및 전원 공급 장치의 전원 스위치를 사용하여 장치에 공급되는 전기를 차단하지 마십시오. 장치는 둘 이상의 코드를 가지고 있을 수 있습니다. 장치에서 모든 전원을 차단하려면 콘센트에서 코드가 모두 분리되어 있는지 확인하십시오.





PELIGRO

La corriente eléctrica procedente de cables de alimentación, teléfonos y cables de comunicación puede ser peligrosa.

Para evitar el riesgo de descarga eléctrica:

- **No conecte ni desconecte los cables ni realice ninguna tarea de instalación, mantenimiento o reconfiguración de este producto durante una tormenta eléctrica.**
- **Conecte todos los cables de alimentación a tomas de corriente debidamente cableadas y conectadas a tierra.**
- **Cualquier equipo que se conecte a este producto también debe conectarse a tomas de corriente debidamente cableadas.**
- **Siempre que sea posible, utilice una sola mano para conectar o desconectar los cables de señal.**
- **No encienda nunca un equipo cuando hay señales de fuego, agua o daños estructurales.**

- **Desconecte los cables de alimentación, los sistemas de telecomunicaciones, las redes y los módems conectados antes de abrir las cubiertas de los dispositivos, a menos que se indique lo contrario en los procedimientos de instalación y configuración.**
- **Conecte y desconecte los cables, como se describe en la tabla siguiente, cuando instale, mueva o abra las cubiertas de este producto o de los dispositivos conectados.**

Para conectar	Para desconectar
1. APÁGUELO todo. 2. En primer lugar, conecte todos los cables a los dispositivos. 3. Conecte los cables de señal a los conectores. 4. Enchufe los cables de alimentación a las tomas de corriente. 5. Encienda el dispositivo.	1. APÁGUELO todo. 2. En primer lugar, desenchufe los cables de alimentación de las tomas de corriente. 3. Desconecte los cables de señal de los conectores. 4. Desconecte todos los cables de los dispositivos.

PRECAUCIÓN:

Cuando sustituya una batería de litio, utilice solamente una batería número de pieza 45C1566 u otra de tipo equivalente recomendada por el fabricante. Si su sistema dispone de un módulo que contiene una batería de litio, reemplácelo sólo con el mismo tipo de módulo, del mismo fabricante. La batería contiene litio y puede explotar si no se utiliza, manipula o desecha correctamente.

No debe:

- **Arrojarla al agua o sumergirla en ella**
- **Exponerla a temperaturas superiores a 100°C (212°F)**
- **Repararla o desmontarla**

Deshágase de la batería según especifiquen las leyes o normas locales.

PRECAUCIÓN:

Cuando haya productos láser (como unidades de CD-ROM, unidades de DVD, dispositivos de fibra óptica o transmisores) instalados, tenga en cuenta lo siguiente:

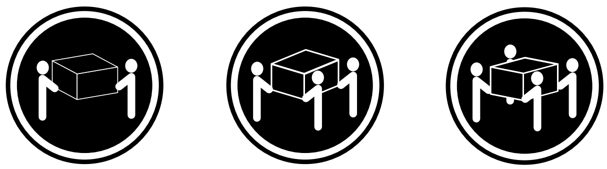
- **No quite las cubiertas. Si quita las cubiertas del producto láser, podría quedar expuesto a radiación láser peligrosa. Dentro del dispositivo no existe ninguna pieza que requiera servicio técnico.**
- **Si usa controles o ajustes o realiza procedimientos que no sean los especificados aquí, podría exponerse a radiaciones peligrosas.**

PELIGRO

Algunos productos láser tienen incorporado un diodo láser de clase 3A o clase 3B. Tenga en cuenta lo siguiente:

Cuando se abre, queda expuesto a radiación láser. No mire directamente al rayo láser, ni siquiera con instrumentos ópticos, y evite exponerse directamente al rayo láser.





≥18 kg (37 lbs) ≥32 kg (70.5 lbs) ≥55 kg (121.2 lbs)

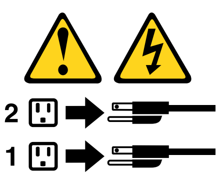
PRECAUCIÓN:

Adopte procedimientos seguros al levantar el equipo.



PRECAUCIÓN:

El botón de control de alimentación del dispositivo y el interruptor de alimentación de la fuente de alimentación no desconectan la corriente eléctrica suministrada al dispositivo. Además, el dispositivo podría tener más de un cable de alimentación. Para suprimir toda la corriente eléctrica del dispositivo, asegúrese de que todos los cables de alimentación estén desconectados de la toma de corriente.



Chapter 3. General information

This chapter provides general information that applies to all machine types supported by this publication.

Lenovo Welcome Center

The Lenovo Welcome program introduces you to some innovative built-in features of Lenovo and guides you through a few important setup tasks to help you make the most of your computer.

Lenovo Solution Center

The Lenovo Solution Center program enables you to troubleshoot and resolve computer problems. It combines diagnostic tests, system information collection, security status, and support information, along with hints and tips for maximum system performance. See “Lenovo Solution Center” on page 35 for detailed information.

SimpleTap

The SimpleTap program provides you with a quick way to customize some basic computer settings such as muting the speakers, adjusting the volume, locking the computer operating system, launching a program, opening a Web page, opening a file, and so on. You also can use the SimpleTap program to access the Lenovo App Shop, from which you can download various applications and computer software.

To start the SimpleTap program in a quick way, do any of the following:

- Click the red SimpleTap launch point on the desktop. The red launch point is available on the desktop after you have launched the SimpleTap program for the first time.
- Press the blue ThinkVantage button if your keyboard has one.

Note: The SimpleTap program is only available on certain models preinstalled with the Windows 7 operating system. If your Windows 7 model is not preinstalled with the SimpleTap program, you can download it from http://www.lenovo.com/support.

Additional information resources

If you have Internet access, the most up-to-date information for your computer is available from the World Wide Web.

You can find the following information:
- CRU removal and installation instructions
- Publications
- Troubleshooting information
- Parts information
- Downloads and drivers
- Links to other useful sources of information

To access this information, point your browser to http://www.lenovo.com/support.

Specifications

This section lists the physical specifications for your ThinkStation computer.

For machine types 4105, 4157, and 4217.

This section lists the physical specifications for your computer.

Dimensions

Width: 175 mm (6.9 inches)

Height: 478 mm (18.8 inches) floor to top of handle

Depth: 460 mm (18.1 inches)

Weight

Maximum configuration: 16.33 kg (36 lbs)

Dimensions rack mounted:

Width: 427 mm (16.8 inches)

Height: 210 mm (8.0 inches)

Depth: 579 mm (22.8 inches)

Environment

- Air temperature:

  Operating at 0 - 3000 ft (914.4 m): 10° to 35°C (50° to 95°F)

  Non-operating: -10° to 60°C (14° to 140°F)

- Humidity:

  Operating: 10% to 80%

  Non-operating: 10% to 90%

  Transit: 10% to 90%

- Maximum altitude: 7000 ft (2133.6 m)

Electrical input

- Input voltage:
  - Range 100 V - 240 V
  - Input kilovolt-amperes (kVA) (approximate)

    Minimum configuration as shipped: 0.17 kVA

    Maximum configuration: 0.8 kVA

For machine types 4155, 4158, and 4218.

Dimensions

Width: 210 mm (8.3 inches)

Height: 485 mm (19.1 inches) floor to top of handle

Depth: 602 mm (23.7 inches)

Weight

Maximum configuration: 26.00 kg (57 lbs)

Rack mounted dimensions:

Width: 427 mm (16.8 inches)

Height: 210 mm (8.3 inches)

Depth: 602 mm (23.7 inches)

Environment

- Air temperature:

  Operating at 0 - 3000 ft (914.4 m): 10° to 35°C (50° to 95°F)

  Non-operating: -10° to 60°C (14° to 140°F)
- Humidity:

  Operating: 10% to 80% (10% per hour)

  Non-operating: 10% to 90% (10% per hour)

  Transit: 10% to 90% (10% per hour)
- Maximum altitude: 7000 ft (2133.6 m)

Electrical input

- Input voltage:
  - Range 100 V - 240 V
  - Input kilovolt-amperes (kVA) (approximate)

    Minimum configuration as shipped: 0.17 kVA

    Maximum configuration: 1.2 kVA

Chapter 4. General Checkout

Attention

The drives in the computer you are servicing might have been rearranged or the drive startup sequence changed. Be extremely careful during write operations such as copying, saving, or formatting. Data or programs can be overwritten if you select an incorrect drive.

General error messages appear if a problem or conflict is found by an application program, the operating system, or both. For an explanation of these messages, refer to the information supplied with that software package.

Before replacing any FRUs, ensure that the latest level of BIOS is installed on the system. A down-level BIOS might cause false errors and unnecessary replacement of the system board. For more information on how to determine and obtain the latest level BIOS, see “BIOS levels” on page 251.

Use the following procedure to help determine the cause of the problem:

1. Power-off the computer and all external devices.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Power-on all external devices.
5. Power-on the computer.
   - Look for displayed error codes
   - Listen for beep codes
   - Look for readable instructions or a main menu on the display.

   If you **did not** receive the correct response, proceed to step 6 on page 33.

   If you **do** receive the correct response, proceed to step 7 on page 33.
6. Look at the following conditions and follow the instructions:
   - If you hear beep codes during POST, go to “Beep symptoms” on page 71.
   - If the computer displays a POST error, go to “POST error codes” on page 72.
   - If the computer hangs and no error is displayed, continue at step 7 on page 33.
7. Run the Diagnostic programs. See Chapter 5 “Diagnostics” on page 35.
   - If you receive an error, replace the part that the diagnostic program calls out or go to “Diagnostic error codes” on page 54.
   - If the test stops and you cannot continue, replace the last device tested.

Problem determination tips

Due to the variety of hardware and software combinations that can be encountered, use the following information to assist you in problem determination. If possible, have this information available when requesting assistance from Service Support and Engineering functions.

- Machine type and model
- Processor or hard disk upgrades
- Failure symptom
  - Do diagnostics indicate a failure?
  - What, when, where, single, or multiple systems?
  - Is the failure repeatable?

- Has this configuration ever worked?
  - If it has been working, what changes were made prior to it failing?
  - Is this the original reported failure?
- Diagnostics version
  - Type and version level
- Hardware configuration
  - Print (print screen) configuration currently in use
  - BIOS level
- Operating system software
  - Type and version level

Notes: To eliminate confusion, identical systems are considered identical only if they:

1. Are the exact machine type and models
2. Have the same BIOS level
3. Have the same adapters/attachments in the same locations
4. Have the same address jumpers/terminators/cabling
5. Have the same software versions and levels
6. Have the same Diagnostic Diskettes (version)
7. Have the same configuration options set in the system
8. Have the same setup for the operating system control files

Comparing the configuration and software set-up between “working and non-working” systems will often lead to problem resolution.

Chapter 5. Diagnostics

Diagnostic programs are used to test hardware components of your computer. Diagnostic programs can also report operating-system-controlled settings that interfere with the correct operation of your system. You can use the preinstalled diagnostic program to diagnose computer problems, if your computer is running in the Windows® operating system.

Notes:

1. Depending on the date when your computer was manufactured, your computer is preinstalled with either the Lenovo Solution Center program or the Lenovo ThinkVantage Toolbox program for diagnostic purposes. For more information about the Lenovo ThinkVantage Toolbox program, see "Lenovo ThinkVantage Tools" on page 35. For more information about the Lenovo Solution Center program, see "Lenovo Solution Center" on page 35.
2. Use PC-Doctor for Windows PE when your Windows operating system does not start.
3. You can also download the PC-Doctor for DOS diagnostic program from http://www.lenovo.com/support. See "PC-Doctor for DOS" on page 36 for detailed information.
4. If you are unable to isolate and repair the problem yourself after running the programs, save and print the log files created by the programs. You will need the log files when you speak to a Lenovo technical support representative.

Lenovo ThinkVantage Tools

The Lenovo ThinkVantage Tools program guides you to a host of information sources and provides easy access to various tools to help you work more easily and securely.

Note: The Lenovo ThinkVantage Tools program is only available on computers preinstalled with Windows 7 from Lenovo.

Lenovo Solution Center

The Lenovo Solution Center program enables you to troubleshoot and resolve computer problems. It combines diagnostic tests, system information collection, security status, and support information, along with hints and tips for maximum system performance.

Notes:

- The Lenovo Solution Center program is available only on models preinstalled with the Windows 7 operating system. If your Windows 7 model is not preinstalled with the program, you can download it from http://www.lenovo.com/diagnose.
- If you are using the Windows Vista or Windows XP operating system, go to http://www.lenovo.com/diagnose for the latest information on diagnostics for your computer.

To run the Lenovo Solution Center program on the Windows 7 operating system, click **Start** ➙ **All Programs** ➙ **Lenovo ThinkVantage Tools** ➙ **System Health and Diagnostics**. Follow the instructions on the screen.

For additional information, refer to the Lenovo Solution Center help system.

Note: If you are unable to isolate and repair the problem yourself after running the program, save and print the log files created by the program. You will need the log files when you speak to a Lenovo technical support representative.

PC-Doctor for Windows PE

The PC-Doctor for Windows PE diagnostic program is part of the Rescue and Recovery workspace on each Lenovo computer. Use PC-Doctor for Windows PE if you are unable to start the Windows operating system or if Lenovo ThinkVantage Toolbox has not been successful in isolating a possible problem.

Running diagnostics from the Rescue and Recovery workspace

You can run the PC-Doctor for Windows PE diagnostic program from the Rescue and Recovery workspace. To run diagnostics from the Rescue and Recovery workspace, use the following procedure:

1. Shut down the operating system and turn off the computer.
2. Repeatedly press and release the F11 key when you turn on the computer.
3. When you hear beeps or see a logo screen, stop pressing the F11 key. The Rescue and Recovery workspace opens.
4. From the Rescue and Recovery workspace, select **Launch Advanced Rescue and Recovery** → **Diagnose hardware**.
5. The diagnostic program opens automatically. Select the diagnostic test you want to run. Press the F1 key for additional help.
6. Follow the instructions on the screen.

Note: Rescue media includes PC-Doctor for Windows PE.

PC-Doctor for DOS

Use PC-Doctor for DOS, if you are unable to start the Windows operating system or if PC-Doctor for Windows has not been successful in isolating a possible problem. You can run PC-Doctor for DOS from a diagnostic CD image or diagnostic diskettes that have been created.

Note: It is important to create a diagnostic CD image or diagnostic diskettes in case PC-Doctor for Windows PE cannot be run from the Rescue and Recovery workspace.

You can also download the latest version of the PC-Doctor for DOS diagnostic program from: http://www.lenovo.com/support. The PC-Doctor for DOS diagnostic program is part of the Rescue and Recovery workspace and runs independently of the Windows operating system. Use PC-Doctor for DOS, if you are unable to start the Windows operating system or if Lenovo ThinkVantage Toolbox and PC-Doctor for Windows PE have not been successful in isolating a possible problem. You can run PC-Doctor for DOS from a diagnostic CD/DVD image that you create. You can also run PC-Doctor for DOS from the Rescue and Recovery workspace.

Note: It is important to create a diagnostic CD/DVD image in case PC-Doctor for DOS cannot be run from the Rescue and Recovery workspace.

Creating a diagnostic CD/DVD image

To create a diagnostic CD/DVD image, download a self-starting bootable CD/DVD image (known as an ISO image) of the diagnostic program from http://www.lenovo.com/support. After you download the image, you can create the CD/DVD using any CD/DVD burning software.

Running diagnostics from the disc

To run diagnostics from the diagnostic CD/DVD image that you created, use the following procedure:

1. Make sure the computer is turned off.

2. Insert the disc into the optical drive.
3. Restart the computer.

   Note: If the diagnostic program does not start, you might not have your optical drive set as a startable device. See “Selecting a startup device” on page 43 for instructions on how to change the startup device.
4. When the diagnostics program opens, follow the instructions on the screen.
5. When the program finishes, be sure to remove the disc from the drive.
6. Select the diagnostic test you want to run. Press the F1 key for additional help.

Running diagnostics from the Rescue and Recovery workspace

To run diagnostics from the Rescue and Recovery workspace, use the following procedure:

Note: If you did not create a diagnostic CD/DVD image, you can run the PC-Doctor for DOS diagnostic program from the Rescue and Recovery workspace.

1. Shut down the operating system and turn off the computer.
2. Repeatedly press and release the F11 key when you turn on the computer.
3. When you hear beeps or see a logo screen, stop pressing the F11 key. The Rescue and Recovery workspace opens.

   Note: For some models, press the Esc key to enter the Rescue and Recovery.
4. From the Rescue and Recovery workspace, select **Launch Advanced Rescue and Recovery** → **Diagnose hardware**.
5. Follow the prompts on the screen. The computer will restart.
6. When the computer restarts, the diagnostic program opens automatically. Select the diagnostic test you want to run. Press the F1 key for additional help.

Navigating through the diagnostics programs

Use the cursor movement keys to navigate within the menus.

- The **Enter** key is used to select a menu item.
- The **Esc** key is used to back up to the previous menu.
- For online help select **F1**.

Running tests

There are four ways to run the diagnostic tests.

- Using the cursor movement keys, highlight **Run Normal Test** or **Run Quick Test** from the Diagnostics menu and then press **Enter**. This automatically runs a pre-defined group of tests from each test category. **Run Normal Test** runs a more extensive set of tests than does **Run Quick Test** and takes longer to complete.
- Press **F5** to automatically run all selected tests in all categories.
- From within a test category, press **Ctrl-Enter** to automatically run only the selected tests in that category.
- Using the cursor movement keys, highlight a single test within a test category, and then press **Enter**. This runs only that test.

Press **Esc** at any time to stop the testing process.

Test results (N/A, PASSED, FAILED, ABORTED) are displayed in the field beside the test description and in the test log. See “Viewing the test log” on page 39.

To select one or more tests, use the following procedure.

1. Open the corresponding test category.
2. Using the cursor movement keys, highlight the desired test.
3. Press the space bar. A selected test is marked by **>>**. Pressing the space bar again de-selects a test and removes the >>.
4. Repeat steps 2 and 3 above to select all desired tests.

Test results

Diagnostics test results produce the following error code format:

Function Code	Failure Type	DeviceID	Date	ChkDigits	Text

- **Function Code:**
  Represents the feature or function within the PC.
- **Failure Type:**
  Represents the type of error encountered.
- **DeviceID:**
  Contains the component's unit-ID which corresponds to either a fixed disk drive, removable media drive, serial or parallel port, processor, specific RIMM, or a device on the PCI bus.
- **Date:**
  Contains the date when the diagnostic test was run. The date is retrieved from CMOS and displayed using the YYYYMMDD format.
- **ChkDigits:**
  Contains a 2-digit check-digit value to ensure the following:
  - Diagnostics were run on the specified date.
  - Diagnostics were run on the specified computer.
  - The diagnostic error code is recorded correctly.
- **Text:**
  Description of the error.

Note: See “Diagnostic error codes” on page 54 for error code listings.

Quick and Full erase - hard drive

The diagnostics program offers two hard drive format utilities:

- Quick Erase Hard Drive
- Full Erase Hard Drive

The Quick Erase Hard Drive provides a DOS utility that performs the following:

- Destroys the Master Boot Record (MBR) on the hard drive.
- Destroys all copies of the FAT Table on all partitions (both the master and backup).
- Destroys the partition table.
- Provides messages that warn the user that this is a non-recoverable process.

The Full Erase Hard Drive provides a DOS utility that performs the following:

- Performs all the steps in Quick Erase.
- Provides a DOS utility that writes random data to all sectors of the hard drive.
- Provides an estimate of time to completion along with a visual representation of completion status.
- Provides messages that warn the user about non-recoverable process.

Important: Make sure that all data is backed up before using the Quick or Full Erase functions.

To select the Quick Erase or Full Erase Hard Drive utility, use the following procedure:

1. Select the UTILITY option on the toolbar and press **Enter**.
2. Select either the QUICK ERASE or FULL ERASE HARD DISK option and follow the instructions.

Viewing the test log

Errors reported by the diagnostic test will be displayed by the program as a failed test.

To view details of a failure or to view a list of test results, use the following procedure from any test category screen:

1. Press **F3** to activate the log file.
2. Press **F3** again to save the file to diskette or press **F2** to print the file.

Chapter 6. Using the Setup Utility

The Setup Utility program is used to view and change the configuration settings of your computer, regardless of which operating system you are using. However, the operating-system settings might override any similar settings in the Setup Utility program.

Starting the Setup Utility program

To start the Setup Utility program, do the following:

1. If your computer is turned on when you start this procedure, shut down the operating system and turn off the computer.
2. Press and hold the F1 key then turn on the computer. When you hear multiple beeps, release the F1 key.

   Notes:

   a. If you are using a USB keyboard and the Setup Utility program does not display using this method, repeatedly press and release the F1 key rather than leaving it pressed when turning on the computer.

   b. If a user password or an administrator password has been set, the Setup Utility program menu is not displayed until you type your password. For more information, see "Using passwords" on page 41.

The Setup Utility program might start automatically when POST detects that hardware has been removed or new hardware has been installed in your computer.

Viewing and changing settings

The Setup Utility program menu lists items that identify system configuration topics. To view or change settings, see "Starting the Setup Utility program " on page 41.

When working with the Setup Utility program menu, you must use the keyboard. The keys used to perform various tasks are displayed at the bottom of each screen.

Using passwords

By using the Setup Utility program, you can set passwords to prevent unauthorized persons from gaining access to your computer and data. See "Starting the Setup Utility program " on page 41. The following types of passwords are available:

- User Password
- Administrator Password

You do not have to set any passwords to use your computer. However, if you decide to set any passwords, read the following sections.

Password considerations

A password can be any combination of up to 12 alphabetic and numeric characters (a-z and 0-9). For security reasons, it is a good idea to use a strong password that cannot be easily compromised. Passwords should adhere to the following rules:

- To set a strong password, have at least eight characters in length and contain at least one alphabetic character and one numeric character
- Setup Utility program and hard disk drive passwords are not case sensitive

- Not be your name or your user name
- Not be a common word or a common name
- Be significantly different from your previous password

User Password

When a User Password is set, the computer cannot be used until a valid password is typed from the keyboard.

Administrator Password

When an Administrator Password is set, it deters unauthorized persons from changing configuration settings. If you are responsible for maintaining the settings of several computers, you might want to set an Administrator Password.

After you set an Administrator Password, a password prompt is displayed each time you try to access the Setup Utility program.

If both the user and administrator passwords are set, you can type either password. However, to change any configuration settings, you must use your administrator password.

Setting, changing, and deleting a password

To set, change, or delete a password, do the following:

Note: A password can be any combination of up to 12 alphabetic and numeric characters. For more information, see "Password considerations" on page 41.

1. Start the Setup Utility program (see Chapter 6 "Using the Setup Utility" on page 41).
2. From the Setup Utility program menu, select **Security** → **Set Passwords**.
3. Select **Set User Password** or **Set Administrator Password**.
4. Read the information displayed on the right side of the screen.

Enabling or disabling a device

You can enable or disable user access to a device.

ICH SATA Controller	When this feature is set to **Disabled**, any optical drives or eSATA devices are disabled and will not be displayed in the system configuration.
Marvell SATA/SAS Controller	When this feature is set to **Disabled**, all internal hard disk drives are disabled and will not be displayed in the system configuration. When disabling this feature, make sure your system has an alternate boot method, such as LAN PXE boot, or a bootable floppy diskette, memory key, or optical disc.
Legacy diskette A	When this feature is set to **Disabled**, the diskette drive cannot be accessed.

To set the ICH SATA Controller or Marvell SATA/SAS Controller, do the following:

1. Start the Setup Utility program (see "Starting the Setup Utility program " on page 41).
2. Depending on which device you want to set, select either **Devices** → **SAS/SATA Drive Setup** → **ICH SATA Controller** or **Devices** → **SAS/SATA Drive Setup** → **Marvell SATA/SAS Controller** from the Setup Utility program menu.
3. Select the desired settings and press Enter.
4. Return to the Setup Utility program menu and select **Exit** → **Save and exit the Setup Utility**.

Note: If you do not want to save the settings, select **Exit the Setup Utility without saving**.

To set the Legacy diskette A, do the following:

1. Start the Setup Utility program (see "Starting the Setup Utility program " on page 41).
2. From the Setup Utility program menu, select **Devices** → **Legacy diskette A**.
3. Select the desired settings and press Enter.
4. Return to the Setup Utility program menu and select **Exit** → **Save and exit the Setup Utility**.

   Note: If you do not want to save the settings, select **Exit the Setup Utility without saving**.

Selecting a startup device

If your computer does not start up (boot) from a device such as the disc, diskette, or hard disk drive as expected, use one of the following procedures to select a startup device.

Selecting a temporary startup device

Use this procedure to start up from any boot device.

Note: Not all discs, hard disk drives, and diskettes are bootable.

1. Turn off your computer.
2. Press and hold the F12 key then turn on the computer. When the Startup Device Menu appears, release the F12 key.

   Note: If you are using a USB keyboard and the Startup Device Menu does not display using this method, repeatedly press and release the F12 key rather than leaving it pressed when turning on the computer.
3. Select the desired startup device from the Startup Device Menu and press Enter to begin.

Note: Selecting a startup device from the Startup Device Menu does not permanently change the startup sequence.

Selecting or changing the startup device sequence

To view or permanently change the configured startup device sequence, do the following:

1. Start the Setup Utility program (see "Starting the Setup Utility program " on page 41).
2. Select **Startup** → **Startup Sequence**, and see the information displayed on the right side of the screen.
3. Select the devices for the Primary Startup Sequence, the Automatic Startup Sequence, and the Error Startup Sequence.
4. Select **Exit** from the **Setup Utility** menu and then **Save Settings** or **Save and exit the Setup Utility**.

If you have changed these settings and want to return to the default settings, select **Load Default Settings** on the **Exit** menu.

Advanced settings

On some computer models, the **Advanced settings** menu includes a setting to enable or disable HyperThreading. This feature works only with HyperThreading-aware operating systems, such as Windows Vista. The default setting for HyperThreading is **Enabled**. However, if you select **Set Defaults** and are using an operating system other than Windows Vista, your computer performance might be degraded. Therefore, you should always set HyperThreading to **Disabled** unless you are sure your operating system supports HyperThreading.

Exiting from the Setup Utility program

After you finish viewing or changing settings, press Esc to return to the Setup Utility program menu (you might have to press Esc several times). If you want to save the new settings, select **Save Settings** or **Save and exit the Setup Utility**. Otherwise, your changes will not be saved.

Chapter 7. Installing hard disk drives and configuring RAID (types 4105, 4157, 4217)

This chapter contains information about installing hard disk drives and configuring Redundant Array of Independent Disks (RAID) for this product.

Note: The information about configuring RAID in this chapter is applicable only for a Windows environment. For information about configuring RAID in a Linux environment, contact your Linux software provider.

Installing SATA hard disk drives and configuring RAID

This section contains information about the required number of SATA hard disk drives for the supported level of RAID and SATA RAID configuration.

Installing SATA hard disk drives

Your computer must have the minimum number of SATA hard disk drives installed for the supported level of RAID below:

- RAID Level 0 – Striped disk array
  - Two hard disk drives minimum
  - Better performance without fault tolerance
- RAID Level 1 – Mirrored disk array
  - Two hard disk drives minimum
  - Improved read performance and 100% redundancy
- RAID Level 5 – Block-level striped disk array with distributed parity
  - Three hard disk drives minimum
  - Data striped at the byte level
  - Stripe error correction information
  - Better performance and fault tolerance

To install a new SATA hard disk drive, refer to the installation procedure in “Replacing a hard disk drive” in the *ThinkStation Hardware Installation and Replacement Guide*.

Configuring the system BIOS to enable SATA RAID functionality

This section describes how to configure the system BIOS to enable SATA RAID functionality.

Note: Use the arrow keys on the keyboard to make selections.

1. Press F1 to enter the system BIOS setup. See “Starting the Setup Utility program ” on page 41.
2. Select **Devices** → **IDE Drives Setup** and press Enter.
3. Select **SATA RAID Enable** and press Enter.
4. Select **Enabled** and press Enter.
5. Press F10 to save the new settings and exit.

Creating RAID volumes

This section describes how to use the Intel Matrix Storage Manager option ROM configuration utility to create RAID volumes.

1. Press Ctrl+I when prompted to enter the Intel Matrix Storage Manager option ROM configuration utility.

   Note: To make enough physical hard disk drives available to create a RAID volume.
2. Use the up and down arrow keys to select **Create RAID Volume** and press Enter.
3. Type a proper RAID Volume name in the **Name** field and press Tab.
4. Use the arrow keys to select a RAID level in the **RAID Level** field and press Tab.
5. If appropriate, use the arrow keys to select a Stripe Size in the **Stripe Size** field and press Tab.
6. Type a volume size in the **Capacity** field and press Tab.
7. Press Enter to initiate volume creation.
8. When prompted, press Y to accept the warning message and create the volume.
9. Return to step 2 on page 46 to create additional RAID volumes, or select **Exit** and press Enter.
10. Press Y when prompted to confirm the exit.

Deleting RAID volumes

This section describes how to use the Intel Matrix Storage Manager option ROM configuration utility to delete RAID volumes.

1. Press Ctrl+I when prompted to enter the Intel Matrix Storage Manager option ROM configuration utility.
2. Use the up and down arrow keys to select **Delete RAID Volume** and press Enter.
3. Use the arrow keys to select the RAID volume to be deleted and press Delete.
4. When prompted, press Y to confirm the deletion of the selected RAID volume. Deleting a RAID volume will reset the hard disk drives to non-RAID.
5. After deleting a RAID volume, you can:
   - Return to step 2 to delete additional RAID volumes.
   - See "Creating RAID volumes" on page 46 for RAID volume creation.
   - Use the up and down arrow keys to select **Exit** and press Enter.
   - Use the up and down arrow keys to select **Reset Disks to Non-RAID** and press Enter.
     a. Use the arrow keys and the space key to mark individual physical hard disk drives to be reset, and then press Enter to complete the selection.
     b. When prompted, press Y to confirm the reset action.
     c. After completing the Reset Disks to Non-RAID function, you can:
        – Return to step 2 to delete additional RAID volumes.
        – See "Creating RAID volumes" on page 46 for RAID volume creation.
        – Use the up and down arrow keys to select **Exit** and press Enter.

Installing SAS hard disk drives and configuring RAID

This section contains information about the required number of SAS hard disk drives for the supported level of RAID and SAS RAID configuration.

Installing SAS hard disk drives

Your computer must have the minimum number of SAS hard disk drives installed for the supported level of RAID below:

- RAID Level 0 – Striped disk array
  - Two hard disk drives minimum
  - Better performance without fault tolerance
- RAID Level 1 – Mirrored disk array
  - Two hard disk drives minimum
  - Improved read performance and 100% redundancy
- RAID Level 5 – Block-level striped disk array with distributed parity
  - Three hard disk drives minimum
  - Data striped at the byte level
  - Stripe error correction information
  - Better performance and fault tolerance

To install a new SAS hard disk drive, refer to the installation procedure in “Replacing a hard disk drive” in the *ThinkStation Hardware Installation and Replacement Guide*.

Entering the Marvell BIOS Setup to configure SAS RAID

This section describes how to enter the Marvell BIOS Setup to configure SAS RAID.

1. Your computer must have a Marvell SAS adapter card (Marvell SAS controller) installed to configure SAS RAID. For installing or replacing a Marvell SAS adapter card, refer to “Replacing an adapter card” in the *ThinkStation Hardware Installation and Replacement Guide*.
2. Turn on the computer after you have installed the required number of SAS hard disk drives and the Marvell SAS adapter card.
3. Press Ctrl+M when prompted to enter the Marvell BIOS Setup to configure SAS RAID.

Configuring the Marvell BIOS Setup to enable SAS RAID 0, 1, or 5 functionality

To enable SAS RAID 0, 1, or 5 functionality, use the Marvell BIOS Setup configuration utility as the SAS configuration utility. This utility assumes that the system has the required number of hard disk drives.

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Create array**.
4. Use the arrow keys and the Enter key to select each free hard disk drive that you want to include in the array.
5. Select **Next** and press Enter.
6. From the **Create array** menu, select **RAID level** and press Enter.

   Note: Only the valid RAID levels will be active.
7. Select the SAS RAID level you want (**RAID 0**, **RAID 1**, or **RAID 5**) and press Enter.
8. From the **Stripe size** menu, you can change the stripe size or keep it as default.
9. Type a proper array name in the **Array name** field.
10. Select **Next** and press Enter. When prompted, press Y to complete the array creation and RAID configuration.

Configuring the Marvell BIOS Setup to set an optional hot spare hard disk drive

To configure the Marvell BIOS Setup to set an optional hot spare hard disk drive:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Spare Management**.
4. Use the arrow keys to select the hard disk drive you want to set as an optional hot spare hard disk drive.
5. Use the arrow keys to select **Next** and press Enter.
6. Press Y when prompted to set the optional hot spare hard disk drive.

Configuring the Marvell BIOS Setup to delete an optional hot spare hard disk drive

To configure the Marvell BIOS Setup to delete an optional hot spare hard disk drive:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Spare Management**.
4. Use the arrow keys to select the optional hot spare hard disk drive you want to delete.
5. Use the arrow keys to select **Next** and press Enter.
6. Press Y when prompted to delete the optional hot spare hard disk drive.

Configuring the Marvell BIOS Setup to delete an array

To configure the Marvell BIOS Setup to delete an array:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Delete array**.
4. Use the arrow keys and the Enter key to select the array you want to delete from the list.
5. Use the arrow keys to select **Next** and press Enter.
6. Press Y when prompted to complete the deletion.

Chapter 8. Installing hard disk drives and configuring RAID (types: 4155, 4158, 4218)

This chapter contains information about installing hard disk drives and configuring Redundant Array of Independent Disks (RAID) for this product.

Note: The information about configuring RAID in this chapter only applies for a Windows environment. For information about configuring RAID in a Linux environment, contact your Linux software provider.

Installing SATA or SAS hard disk drives and configuring RAID

This section contains information about the required number of SATA or SAS hard disk drives for the supported level of RAID configuration.

Note: Your computer must have either all SATA hard disk drives or all SAS hard disk drives installed. However, be sure that you do not install both the SATA and SAS hard disk drives into the same computer.

Installing SATA or SAS hard disk drives

Your computer must have the minimum number of SATA or SAS hard disk drives installed for the supported level of RAID below:

- RAID Level 0 – Striped disk array
  - Two hard disk drives minimum
  - Better performance without fault tolerance
- RAID Level 1 – Mirrored disk array
  - Two hard disk drives minimum
  - Improved read performance and 100% redundancy
- RAID Level 5 – Block-level striped disk array with distributed parity
  - Three hard disk drives minimum
  - Data striped at the byte level
  - Stripe error correction information
  - Better performance and fault tolerance
- RAID Level 10 – Combining features of RAID 0 and RAID 1
  - Four hard disk drives minimum
  - Very high reliability combined with high performance
  - Fault tolerance

To install a new SATA or SAS hard disk drive, refer to the installation procedure in “Replacing a hard disk drive” in the *ThinkStation Hardware Installation and Replacement Guide*.

Entering the Marvell BIOS Setup to configure SATA or SAS RAID

This section describes how to enter the Marvell BIOS Setup to configure a SATA or SAS RAID.

1. Turn on the computer after you have installed the required number of SATA or SAS hard disk drives.
2. Press Ctrl+M when prompted to enter the Marvell BIOS Setup to configure SATA/SAS RAID.

Configuring the Marvell BIOS Setup to enable SATA or SAS RAID 0, 1, 5, or 10 functionality

To enable SATA/SAS RAID functionality, use the Marvell BIOS Setup configuration utility as the SATA/SAS configuration utility. This utility assumes that the system has the required number of hard disk drives.

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Create array**.
4. Use the arrow keys and the Enter key to select each free hard disk drive that you want to include in the array.
5. Select **Next** and press Enter.
6. From the **Create array** menu, select **RAID level** and press Enter.

   Note: Only the valid RAID levels will be active.
7. Select your desired RAID level (**RAID 0**, **RAID 1**, **RAID 5**, or **RAID 10**) and press Enter.
8. From the **Stripe size** menu, you can change the stripe size or keep it as default.
9. Type a proper array name in the **Array name** field.
10. Select **Next** and press Enter.
11. When prompted, press Y to complete the array creation and RAID configuration.

Configuring the Marvell BIOS Setup to set an optional hot spare hard disk drive

To configure the Marvell BIOS Setup to set an optional hot spare hard disk drive:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Spare Management**.
4. Use the arrow keys to select the hard disk drive you want to set as an optional hot spare hard disk drive.
5. Use the arrow keys to select **Next** and press Enter.
6. Press Y when prompted to set the optional hot spare hard disk drive.

Configuring the Marvell BIOS Setup to delete an optional hot spare hard disk drive

To configure the Marvell BIOS Setup to delete an optional hot spare hard disk drive:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.
2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Spare Management**.
4. Use the arrow keys to select the optional hot spare hard disk drive you want to delete.
5. Use the arrow keys to select **Next** and press Enter.
6. Press Y when prompted to delete the optional hot spare hard disk drive.

Configuring the Marvell BIOS Setup to delete an array

To configure the Marvell BIOS Setup to delete an array:

1. Turn on your computer and press Ctrl+M when prompted to enter the Marvell BIOS Setup.

2. On the Marvell BIOS Setup screen, use the arrow keys to select **RAID Config** and press Enter. The **RAID Config** menu opens.
3. From the **RAID Config** menu, select **Delete array**.
4. Use the arrow keys and the Enter key to select the array you want to delete from the list.
5. Use the arrow keys to select **Next** and press Enter.
6. Press Y when prompted to complete the deletion.

Chapter 9. Symptom-to-FRU Index

The Symptom-to-FRU index lists error symptoms and possible causes. The most likely cause is listed first. Always begin with Chapter 4 "General Checkout" on page 33. This index can also be used to help you decide which FRUs to have available when servicing a computer. If you are unable to correct the problem using this index, go to "Undetermined problems" on page 75.

Notes:

- If you have both an error message and an incorrect audio response, diagnose the error message first.
- If you cannot run the diagnostic tests or you get a diagnostic error code when running a test, but did receive a POST error message, diagnose the POST error message first.
- If you did not receive any error message, look for a description of your error symptoms in the first part of this index.

Hard disk drive boot error

A hard disk drive boot error can have the following causes.

Error	FRU/Action
The start-up drive is not in the boot sequence in configuration.	Check the configuration and ensure the start-up drive is in the boot sequence.
No operating system installed on the boot drive.	Install an operating system on the boot drive.
The boot sector on the start-up drive is corrupted.	The drive must be formatted, do the following: 1. Attempt to back-up the data on the failing hard disk drive. 2. Using the operating systems programs, format the hard disk drive.
The drive is defective.	Replace the hard disk drive.

Power Supply Problems

If you suspect a power problem, use the following procedures.

Check/Verify	FRU/Action
Check the following for proper installation. • Power Cord • On/Off Switch connector • On/Off Switch Power Supply connector • System Board Power Supply connectors • Microprocessor(s) connection	Reseat connectors
Check the power cord for continuity.	Power Cord
Check the power-on switch for continuity.	Power-on Switch

Diagnostic error codes

Refer to the following diagnostic error codes when using the diagnostic tests. See "Running tests" on page 37 for the specific type for information about the Diagnostic programs.

In the following index, *X* can represent any number.

Diagnostic Error Code	FRU/Action
000-000-XXX BIOS Test Passed	**No action**
000-002-XXX BIOS Timeout	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
000-024-XXX BIOS Addressing test failure	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
000-025-XXX BIOS Checksum Value error	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
000-026-XXX FLASH data error	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
000-027-XXX BIOS Configuration/Setup error	1. **Run Setup** 2. Flash the system. See "Flash update procedures" on page 251 3. System board
000-034-XXX BIOS Buffer Allocation failure	1. **Reboot the system** 2. Flash the system. See "Flash update procedures" on page 251 3. Run memory test 4. System board
000-035-XXX BIOS Reset Condition detected	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
000-036-XXX BIOS Register error	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
000-038-XXX BIOS Extension failure	1. **Flash the system. See "Flash update procedures" on page 251** 2. Adapter card 3. System board
000-039-XXX BIOS DMI data error	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
000-195-XXX BIOS Test aborted by user	**Information only** Re-start the test, if necessary
000-196-XXX BIOS test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
000-197-XXX BIOS test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
000-198-XXX BIOS test aborted	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Flash the system and retest. See "Flash update procedures" on page 251 3. Go to "Undetermined problems" on page 75
000-199-XXX BIOS test failed, cause unknown	1. Go to "Undetermined problems" on page 75 2. Flash the system and re-test 3. Replace component under function test
000-250-XXX BIOS APM failure	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
000-270-XXX BIOS ACPI failure	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
001-000-XXX System Test Passed	**No action**
001-00X-XXX System Error	**System board**
001-01X-XXX System Error	**System board**
001-024-XXX System Addressing test failure	**System board**
001-025-XXX System Checksum Value error	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
001-026-XXX System FLASH data error	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
001-027-XXX System Configuration/Setup error	1. **Run Setup** 2. Flash the system. See "Flash update procedures" on page 251 3. System board
001-032-XXX System Device Controller failure	**System board**
001-034-XXX System Device Buffer Allocation failure	1. **Reboot the system** 2. Flash the system. See "Flash update procedures" on page 251 3. Run memory test 4. System board
001-035-XXX System Device Reset condition detected	**System board**
001-036-XXX System Register error	**System board**

Diagnostic Error Code	FRU/Action
001-038-XXX System Extension failure	1. **Adapter card** 2. System board
001-039-XXX System DMI data structure error	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
001-040-XXX System IRQ failure	1. **Power-off/on system and re-test** 2. System board
001-041-XXX System DMA failure	1. **Power-off/on system and re-test** 2. System board
001-195-XXX System Test aborted by user	**Information only** Re-start the test, if necessary
001-196-XXX System test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
001-197-XXX System test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
001-198-XXX System test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Flash the system and retest. See "Flash update procedures" on page 251 3. Go to "Undetermined problems" on page 75
001-199-XXX System test failed, cause unknown	1. Go to "Undetermined problems" on page 75 2. Flash the system and re-test 3. Replace component under function test
001-250-XXX System ECC error	**System board**
001-254-XXX 001-255-XXX 001-256-XXX 001-257-XXX System DMA error	**System board**
001-260-XXX 001-264-XXX System IRQ error	**System board**
001-268-XXX System IRQ1 failure	1. **Device on IRQ1** 2. System board
001-269-XXX System IRQ2 failure	1. **Device on IRQ2** 2. System board
001-270-XXX System IRQ3 failure	1. **Device on IRQ3** 2. System board
001-271-XXX System IRQ4 failure	1. **Device on IRQ4** 2. System board
001-272-XXX System IRQ5 failure	1. **Device on IRQ5** 2. System board

Diagnostic Error Code	FRU/Action
001-273-XXX System IRQ6 (diskette drive) failure	1. **Diskette Cable** 2. Diskette drive 3. System board
001-274-XXX System IRQ7 failure	1. **Device on IRQ7** 2. System board
001-275-XXX System IRQ8 failure	1. **Device on IRQ8** 2. System board
001-276-XXX System IRQ9 failure	1. **Device on IRQ9** 2. System board
001-277-XXX System IRQ10 failure	1. **Device on IRQ10** 2. System board
001-278-XXX System IRQ11 failure	1. **Device on IRQ11** 2. System board
001-279-XXX System IRQ12 failure	1. **Device on IRQ12** 2. System board
001-280-XXX System IRQ13 failure	1. **Device on IRQ13** 2. System board
001-281-XXX System IRQ14 (hard disk drive) failure	1. **Hard disk drive cable** 2. Hard disk drive 3. System board
001-282-XXX System IRQ15 failure	1. **Device on IRQ15** 2. System board
001-286-XXX 001-287-XXX 001-288-XXX System Timer failure	**System board**
001-292-XXX System CMOS RAM error	1. **Run Setup and re-test** 2. System board
001-293-XXX System CMOS Battery	1. **CMOS Battery** 2. System board
001-298-XXX System RTC date/time update failure	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
001-299-XXX System RTC periodic interrupt failure	**System board**
001-300-XXX System RTC Alarm failure	**System board**
001-301-XXX System RTC Century byte error	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
005-000-XXX Video Test Passed	**No action**
005-00X-XXX Video error	1. **Video card, if installed** 2. System board
005-010-XXX 005-011-XXX 005-012-XXX 005-013-XXX Video Signal failure	1. **Video card, if installed** 2. System board

Diagnostic Error Code	FRU/Action
005-016-XXX Video Simple Pattern test failure	1. **Video Ram** 2. Video card, if installed 3. System board
005-024-XXX Video Addressing test failure	1. **Video card, if installed** 2. System board
005-025-XXX Video Checksum Value error	1. **Video card, if installed** 2. System board
005-027-XXX Video Configuration/Setup error	1. **Run Setup** 2. Video drivers update 3. Video card, if installed 4. System board
005-031-XXX Video Device Cable failure	1. **Video cable** 2. Monitor 3. Video card, if installed 4. System board
005-032-XXX Video Device Controller failure	1. **Video card, if installed** 2. System board
005-036-XXX Video Register error	1. **Video card, if installed** 2. System board
005-038-XXX System BIOS extension failure	1. **Video card, if installed** 2. System board
005-040-XXX Video IRQ failure	1. **Video card, if installed** 2. System board
005-195-XXX Video Test aborted by user	**Information only** Re-start the test, if necessary
005-196-XXX Video test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
005-197-XXX Video test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Re-run test 3. Replace the component called out in warning statement 4. Replace the component under test
005-198-XXX Video test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Go to "Undetermined problems" on page 75
005-199-XXX Video test failed, cause unknown	1. Go to "Undetermined problems" on page 75 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Replace component under function test

Diagnostic Error Code	FRU/Action
005-2XX-XXX 005-3XX-XXX Video subsystem error	1. **Video card, if installed** 2. System board
006-000-XXX Diskette interface Test Passed	**No action**
006-0XX-XXX Diskette interface error	1. **Diskette drive Cable** 2. Diskette drive 3. System board
006-195-XXX Diskette interface Test aborted by user	**Information only** Re-start the test, if necessary
006-196-XXX Diskette interface test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
006-197-XXX Diskette interface test warning	1. **If a component is called out, make sure it is connected and/or enabled** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
006-198-XXX Diskette interface test aborted	1. **If a component is called out, make sure it is connected and/or enabled** 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Go to "Undetermined problems" on page 75
006-199-XXX Diskette interface test failed, cause unknown	1. Go to "Undetermined problems" on page 75 2. Flash the system and re-test 3. Replace component under function test
006-25X-XXX Diskette interface Error	1. **Diskette drive cable** 2. Diskette drive 3. System board
011-000-XXX Serial port Interface Test Passed	**No action**
011-001-XXX Serial port Presence	1. **Remove external serial device, if present** 2. Run setup, enable port 3. System board
011-002-XXX 011-003-XXX Serial port Timeout/Parity error	**System board**
011-013-XXX 011-014-XXX Serial port Control Signal/Loopback test failure	**System board**
011-015-XXX Serial port External Loopback failure	1. **Wrap plug** 2. System board
011-027-XXX Serial port Configuration/Setup error	1. **Run Setup, enable port** 2. Flash the system. See "Flash update procedures" on page 251 3. System board
011-03X-XXX 011-04X-XXX Serial port failure	**System board**
011-195-XXX Serial port Test aborted by user	**Information only** Re-start the test, if necessary

Diagnostic Error Code	FRU/Action
011-196-XXX Serial port test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
011-197-XXX Serial port test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
011-198-XXX Serial port test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Go to "Undetermined problems" on page 75
011-199-XXX Serial port test failed, cause unknown	1. Go to "Undetermined problems" on page 75 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Replace component under function test
011-2XX-XXX Serial port signal failure	1. **External serial device** 2. System board
014-000-XXX Parallel port Interface Test Passed	**No action**
014-001-XXX Parallel port Presence	1. **Remove external parallel device, if present** 2. Run setup, enable port 3. System board
014-002-XXX 014-003-XXX Parallel port Timeout/Parity error	**System board**
014-013-XXX 014-014-XXX Parallel port Control Signal/Loopback test failure	**System board**
014-015-XXX Parallel port External Loopback failure	1. **Wrap plug** 2. System board
014-027-XXX Parallel port Configuration/Setup error	1. **Run Setup, enable port** 2. Flash the system. See "Flash update procedures" on page 251 3. System board
014-03X-XXX 014-04X-XXX Parallel port failure	**System board**
014-195-XXX Parallel port Test aborted by user	**Information only** Re-start the test, if necessary
014-196-XXX Parallel port test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
014-197-XXX Parallel port test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
014-198-XXX Parallel port test aborted	1. **If a component is called out, make sure it is connected and/or enabled** 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Go to "Undetermined problems" on page 75
014-199-XXX Parallel port test failed, cause unknown	1. Go to "Undetermined problems" on page 75 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Replace component under function test
014-2XX-XXX 014-3XX-XXX Parallel port failure	1. **External parallel device** 2. System board
015-000-XXX USB port Interface Test Passed	**No action**
015-001-XXX USB port Presence	1. **Remove USB device(s) and re-test** 2. System board
015-002-XXX USB port Timeout	1. **Remove USB device(s) and re-test** 2. System board
015-015-XXX USB port External Loopback failure	1. **Remove USB device(s) and re-test** 2. System board
015-027-XXX USB port Configuration/Setup error	1. **Flash the system. See "Flash update procedures" on page 251** 2. System board
015-032-XXX USB port Device Controller failure	**System board**
015-034-XXX USB port buffer allocation failure	1. **Reboot the system** 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Run memory test 4. System board
015-035-XXX USB port Reset condition detected	1. **Remove USB device(s) and re-test** 2. System board
015-036-XXX USB port Register error	**System board**
015-040-XXX USB port IRQ failure	1. **Run setup and check for conflicts** 2. Flash the system. See "Flash update procedures" on page 251 3. System board
015-195-XXX USB port Test aborted by user	**Information only** Re-start the test, if necessary

Diagnostic Error Code	FRU/Action
015-196-XXX USB port test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
015-197-XXX USB port test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
015-198-XXX USB port test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Go to “Undetermined problems” on page 75
015-199-XXX USB port test failed, cause unknown	1. Go to “Undetermined problems” on page 75 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Replace component under function test
018-000-XXX PCI Card Test Passed	**No action**
018-0XX-XXX PCI Card Failure	1. **Riser card, if installed** 2. System board
018-195-XXX PCI Card Test aborted by user	1. **PCI card** 2. **Information only** Re-start the test, if necessary
018-196-XXX PCI Card test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
018-197-XXX PCI Card test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
018-198-XXX PCI Card test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Go to “Undetermined problems” on page 75
018-199-XXX PCI Card test failed, cause unknown	1. Go to “Undetermined problems” on page 75 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Replace component under function test

Diagnostic Error Code	FRU/Action
018-250-XXX PCI Card Services error	1. **PCI card** 2. Riser card, if installed 3. System board
020-000-XXX PCI Interface Test Passed	**No action**
020-0XX-XXX PCI Interface error	1. **PCI card** 2. Riser card, if installed 3. System board
020-195-XXX PCI Test aborted by user	**Information only** Re-start the test, if necessary
020-196-XXX PCI test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
020-197-XXX PCI test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
020-198-XXX PCI test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Go to "Undetermined problems" on page 75
020-199-XXX PCI test failed, cause unknown	1. Go to "Undetermined problems" on page 75 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Replace component under function test
020-262-XXXPCI system error	1. **PCI card** 2. Riser card, if installed 3. System board
025-000-XXXIDE interface Test Passed	**No action**
025-00X-XXX 025-01X-XXX IDE interface failure	1. **IDE signal cable** 2. Check power supply voltages 3. Reseat IDE signal cable 4. IDE device 5. System board
025-027-XXX IDE interface Configuration/Setup error	1. **IDE signal cable** 2. Flash the system. See "Flash update procedures" on page 251 3. Reseat IDE signal cable 4. IDE device 5. System board

Diagnostic Error Code	FRU/Action
025-02X-XXX 025-03X-XXX 025-04X-XXX IDE Interface failure	1. **IDE signal cable** 2. Check power supply 3. Reseat IDE signal cable 4. IDE device 5. System board
025-195-XXX IDE interface Test aborted by user	**Information only** Re-start the test, if necessary
025-196-XXX IDE interface test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
025-197-XXX IDE interface test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
025-198-XXX IDE interface test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Go to "Undetermined problems" on page 75
025-199-XXX IDE interface test failed, cause unknown	1. Go to "Undetermined problems" on page 75 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Replace component under function test
030-000-XXX SCSI interface Test Passed	**No action**
030-00X-XXX 030-01X-XXX SCSI interface failure	1. **SCSI signal cable** 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-027-XXX SCSI interface Configuration/Setup error	1. **SCSI signal cable** 2. Flash the system. See "Flash update procedures" on page 251 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-03X-XXX 030-04X-XXX SCSI interface error	1. **SCSI signal cable** 2. Check power supply 3. SCSI device 4. SCSI adapter card, if installed 5. System board
030-195-XXX SCSI interface Test aborted by user	**Information only** Re-start the test, if necessary

Diagnostic Error Code	FRU/Action
030-196-XXX SCSI interface test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
030-197-XXX SCSI interface test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
030-198-XXX SCSI interface test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Go to “Undetermined problems” on page 75
030-199-XXX SCSI interface test failed, cause unknown	1. Go to “Undetermined problems” on page 75 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Replace component under function test
035-000-XXX RAID interface Test Passed	**No action**
035-0XX-XXX RAID interface Failure	1. **RAID signal cable** 2. RAID device 3. RAID adapter card, if installed 4. System board
035-195-XXX RAID interface Test aborted by user	**Information only** Re-start the test, if necessary
035-196-XXX RAID interface test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
035-197-XXX RAID interface test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
035-198-XXX RAID interface test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Go to “Undetermined problems” on page 75
035-199-XXX RAID interface test failed, cause unknown	1. See “Undetermined problems” on page 75 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Replace component under function test
071-000-XXX Audio port Interface Test Passed	**No action**

Diagnostic Error Code	FRU/Action
071-00X-XXX 071-01X-XXX 071-02X-XXX Audio port error	1. **Run Setup** 2. Flash the system. See “Flash update procedures” on page 251 3. System board
071-03X-XXX Audio port failure	1. **Speakers** 2. Microphone 3. Audio card, if installed 4. System board
071-04X-XXX Audio port failure	1. **Run Setup** 2. Audio card, if installed 3. System board
071-195-XXX Audio port Test aborted by user	**Information only** Re-start the test, if necessary
071-196-XXX Audio port test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
071-197-XXX Audio port test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
071-198-XXX Audio port test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Go to “Undetermined problems” on page 75
071-199-XXX Audio port test failed, cause unknown	1. See “Undetermined problems” on page 75 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Replace component under function test
071-25X-XXX Audio port failure	1. **Speakers** 2. Audio card, if installed 3. System board
080-000-XXX Game Port interface Test Passed	**No action**
080-XXX-XXX Game Port interface Error	1. **Remove the game port device and re-test the system**
080-195-XXX Game Port interface Test aborted by user	**Information only** Re-start the test, if necessary
080-196-XXX Game Port interface test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file

Diagnostic Error Code	FRU/Action
080-197-XXX Game Port interface test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
080-198-XXX Game Port interface test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Go to “Undetermined problems” on page 75
080-199-XXX Game Port interface test failed, cause unknown	1. See “Undetermined problems” on page 75 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Replace component under function test
086-000-XXX Mouse Port interface Test Passed	**No action**
086-001-XXX Mouse Port interface Presence	1. **Mouse** 2. System board
086-032-XXX Mouse Port interface Device controller failure	1. **Mouse** 2. System board
086-035-XXX Mouse Port interface Reset	1. **Mouse** 2. System board
086-040-XXX Mouse Port interface IRQ failure	1. **Run Setup** 2. Mouse 3. System board
086-195-XXX Mouse Port interface Test aborted by user	**Information only** Re-start the test, if necessary
086-196-XXX Mouse Port interface test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
086-197-XXX Mouse Port interface test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
086-198-XXX Mouse Port interface test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 “Using the Setup Utility” on page 41** 2. Flash the system and re-test. See “Flash update procedures” on page 251 3. Go to “Undetermined problems” on page 75

Diagnostic Error Code	FRU/Action
086-199-XXX Mouse Port interface test failed, cause unknown	1. See "Undetermined problems" on page 75 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Replace component under function test
089-000-XXX Microprocessor Test Passed	**No action**
089-XXX-XXX Microprocessor failure	1. **Microprocessor(s)** 2. System board
089-195-XXX Microprocessor Test aborted by user	**Information only** Re-start the test, if necessary
089-196-XXX Microprocessor test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
089-197-XXX Microprocessor test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
089-198-XXX Microprocessor test aborted	1. **Flash the system. See "Flash update procedures" on page 251** 2. Go to "Undetermined problems" on page 75
089-199-XXX Microprocessor test failed, cause unknown	1. See "Undetermined problems" on page 75 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Replace component under function test
170-000-XXX Voltage Sensor(s) Test Passed	**No action**
170-0XX-XXX Voltage Sensor(s) failure	1. **Flash system** 2. System board
170-195-XXX Voltage Sensor(s) Test aborted by user	**Information only** Re-start the test, if necessary
170-196-XXX Voltage Sensor(s) test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
170-197-XXX Voltage Sensor(s) test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
170-198-XXX Voltage Sensor(s) test aborted	1. **If a component is called out, make sure it is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Go to "Undetermined problems" on page 75

Diagnostic Error Code	FRU/Action
170-199-XXX Voltage Sensor(s) test failed, cause unknown	1. **See "Undetermined problems" on page 75** 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Replace component under function test
170-250-XXX 170-251-XXX Voltage Sensor(s) Voltage limit error	1. **Power supply** 2. System board
170-254-XXX Voltage Sensor(s) Voltage Regulator Module error	1. **Voltage Regulator Module (VRM)** 2. Microprocessor 3. System board
175-000-XXX Thermal Sensor(s) Test Passed	**No action**
175-0XX-XXX Thermal Sensor(s) failure	1. **Flash system** 2. System board
175-195-XXX Thermal Sensor(s) Test aborted by user	**Information only** Re-start the test, if necessary
175-196-XXX Thermal Sensor(s) test halt, error threshold exceeded	1. **Press F3 to review the log file** 2. Re-start the test to reset the log file
175-197-XXX Thermal Sensor(s) test warning	1. **Make sure the component that is called out is connected and/or enabled. See Chapter 6 "Using the Setup Utility" on page 41** 2. Re-run test 3. Replace the component that is called out in warning statement 4. Replace the component under test
175-198-XXX Thermal Sensor(s) test aborted	1. **If a component is called out, make sure it is connected and/or enabled** 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Go to "Undetermined problems" on page 75
175-199-XXX Thermal Sensor(s) test failed, cause unknown	1. **See "Undetermined problems" on page 75** 2. Flash the system and re-test. See "Flash update procedures" on page 251 3. Replace component under function test
175-250-XXX 175-251-XXX Thermal Sensor(s) limit error	1. **Check fans** 2. Check Power supply voltages 3. Microprocessor 4. System board
185-000-XXX Asset Security Test Passed	**No action**
185-XXX-XXX Asset Security failure	1. **Flash system** 2. System board
185-278-XXX Asset Security Chassis Intrusion	1. **Assure Asset Security Enabled** 2. C2 Cover Switch 3. System board
201-000-XXX System Memory Test Passed	**No action**

Diagnostic Error Code	FRU/Action
201-XXX-XXX System Memory error	1. **Replace the memory module called out by the test** 2. System board
202-000-XXX System Cache Test Passed	**No action**
202-XXX-XXX System Cache error	1. **Cache, if removable** 2. System board 3. Microprocessor
206-000-XXX Diskette Drive Test Passed	**No action**
206-XXX-XXX Diskette Drive error	1. **Diskette Drive Cable** 2. Check power supply voltages 3. Diskette drive 4. System board
215-000-XXX CD-ROM Drive Test Passed	**No action**
215-XXX-XXX CD-ROM Drive error	1. **CD-ROM Drive Cable** 2. Check power supply voltages 3. CD-ROM drive 4. System board
217-000-XXX Hard Disk Drive Test Passed	**No action**
217-25X-XXX 217-26X-XXX Hard Disk Drive (IDE) error	1. **Hard Disk Drive Cable** 2. Check power supply voltages 3. Reseat the hard disk drive cable 4. Hard Disk drive (IDE) 5. System board
217-28X-XXX 217-29X-XXX Hard Disk Drive (SCSI) error	1. **Hard Disk Drive Cable** 2. Check power supply voltages 3. Reseat the hard disk drive cable 4. Hard Disk drive (SCSI) 5. SCSI adapter card 6. System board
220-000-XXX Hi-Capacity Cartridge Drive Test Passed	**No action**
220-XXX-XXX Hi-Capacity Cartridge Drive error	1. **Remove the Hi-Capacity Cartridge Drive and re-test the system**
301-XXX-XXX Keyboard error	1. **Keyboard** 2. Check and test mouse 3. System board
301-000-XXX Keyboard Test Passed	**No action**
302-000-XXX Mouse Test Passed	**No action**
302-XXX-XXX Mouse error	1. **Mouse** 2. Check and test Keyboard 3. System board
303-000-XXX Joystick Test Passed	**No action**
303-XXX-XXX Joystick error	**Remove the Joystick and re-test the system**

Diagnostic Error Code	FRU/Action
305-000-XXX Monitor DDC Test Passed	**No action**
305-250-XXX Monitor DDC self test failure	1. **Run Setup to enable DDC** 2. Cable 3. Monitor 4. Video card 5. System board
415-000-XXX Modem Test Passed	**No action**
415-XXX-XXX Modem error	**Remove the Modem and re-test the system**

Beep symptoms

Beep symptoms are tones or a series of tones separated by pauses (intervals without sound) during POST.

The following tables describes beep symptoms.

Beep Symptom	FRU/Action
2 short beeps CMOS setting error	Perform the following actions in order. 1. Start the Setup Utility program and press F10 to Save and exit. See Chapter 6 "Using the Setup Utility" on page 41. 2. Start the Setup Utility program and press F7 to load defaults and then press F10 to Save and exit. 3. Perform a Boot block recovery. See "Recovering from a POST/BIOS update failure" on page 252.
1 long and 2 short beeps Monitor or video adapter card error	Perform the following actions in order. 1. Make sure the monitor is properly connected to the computer. 2. Replace the video adapter card (if present). 3. Replace the system board.
1 long and 3 short beeps Keyboard error	Perform the following actions in order. 1. Make sure the keyboard is properly connected to the keyboard connector. 2. Replace the keyboard. 3. Replace the system board.
1 long and 9 short beeps BIOS ROM error	Perform the following actions in order. 1. Start the Setup Utility program and press F7 to load defaults and then press F10 to Save and exit. See Chapter 6 "Using the Setup Utility" on page 41. 2. Perform a Boot block recovery. See "Recovering from a POST/BIOS update failure" on page 252. 3. Replace the system board.
Continuos long beeps DRAM memory error	Perform the following actions in order. 1. Make sure the memory module(s) are properly seated in the connector(s). 2. Replace the memory module(s). 3. Replace the system board.

POST error codes

Each time you power-on the system, it performs a series of tests that check the operation of the system and some options. This series of tests is called the *Power-On Self-Test*, or *POST*. POST does the following operations.

- Checks some basic system-board operations
- Checks the memory operation
- Starts the video operation
- Verifies that the boot drive is working

If the POST detects a problem, an error message appears on the screen. A single problem can cause several error messages to appear. When you correct the cause of the first error message, the other error messages probably will not appear on the screen the next time you turn on the system.

POST Error Message	Description/Action
CMOS battery failed	The CMOS battery is no longer functional. Replace the battery.
CMOS checksum error - defaults loaded	Checksum of CMOS is incorrect. The computer loads the default configuration settings. This error might indicate that CMOS has become corrupt due to a weak CMOS battery.
CPU at nnnn	nnnn is the running speed of the microprocessor.
Press Esc to skip memory test	Pressing Esc skips the full memory test
HARD DISK INSTALL FAILURE	Cannot find or initialize the hard disk drive controller or the drive. Make sure the hard disk drive is correctly installed. If no hard disk drives are installed, make sure the hard disk drive selection in Setup is set to NONE.
Keyboard error or no keyboard present	Cannot initialize the keyboard. Make sure the keyboard is properly connected to the computer and that no keys are held pressed during POST. To purposely configure the computer without a keyboard, set the error halt condition in Setup to HALT ON ALL, BUT KEYBOARD. The BIOS then ignores the missing keyboard during POST.
Memory Test:	This message displays during a full memory test, counting down the memory areas being tested.
Memory test fail	If POST detects an error during memory testing, additional information appears. This information gives specifics about the type and location of the memory error.

POST Error Message	Description/Action
Press TAB to show POST screen	Pressing the TAB key permits the user to toggle between the default POST display screen and a custom POST display screen.
Error: Non-System disk or disk error Replace and press any key when ready	The BIOS was unable to find a suitable boot device. Make sure the boot drive is properly connected to the computer. Make sure you have bootable media.

Miscellaneous error messages

Message/Symptom	FRU/Action
Changing display colors	**Display/Monitor**
Computer will *not* power-off. See “Hard disk drive boot error” on page 53.	1. **Power Switch** 2. System Board 3. Riser card, if installed
Computer will *not* RPL from server	1. **Ensure that network is in startup sequence as first device or first device after diskette** 2. Ensure that network adapter is enabled for RPL 3. Network adapter (Advise network administrator of new MAC address)
Computer will *not* perform a Wake On LAN® (if applicable)	1. **Check power supply and signal cable connections to network adapter** 2. Ensure that the operating system settings are set to enable Wake on LAN 3. Ensure Wake On LAN feature is enabled in Setup/Configuration (see “Starting the Setup Utility program ” on page 41) 4. Ensure network administrator is using correct MAC address 5. Ensure no interrupt or I/O address conflicts 6. Network adapter (advise network administrator of new MAC address)
Dead computer. See “Hard disk drive boot error” on page 53.	1. **Power Supply** 2. System Board
Diskette drive in-use light remains on or does not light when drive is active.	1. **Diskette Drive** 2. System Board 3. Diskette Drive Cable
Flashing cursor with an otherwise blank display.	1. **System Board** 2. Primary Hard Disk Drive 3. Hard Disk Drive Cable
Incorrect memory size during POST	1. **Run the Memory tests** 2. Memory Module 3. System Board

Message/Symptom	FRU/Action
"Insert a Diskette" icon appears with a known-good diagnostics diskette in the first 3.5-inch diskette drive.	1. **System Board** 2. Diskette Drive Cable 3. Network Adapter
Intensity or color varies from left to right of characters and color bars	1. **Display** 2. Video adapter (if present) 3. System Board
No power or fan not running	1. **See "Hard disk drive boot error" on page 53.**
Non-system disk or disk error-type message with a known-good diagnostic diskette.	1. **Diskette Drive** 2. System Board 3. Diskette Drive Cable
Other display symptoms not listed above (including blank or illegible display)	1. **Display** 2. System Board
Power-on indicator or hard disk drive in-use light not on, but computer works correctly	1. Power switch/LED assembly 2. System Board
Printer problems	1. **Printer** 2. System Board
Program loads from the hard disk with a known-good diagnostics diskette in the first 3.5-inch diskette drive	1. **Run Setup** and check Startup sequence. 2. Diskette Drive 3. Diskette Drive Cable 4. System Board 5. Power Supply
RPL computer cannot access programs from its own hard disk.	1. **If network administrator is using LCCM Hybrid RPL, check startup sequence:** a. **First device - network** b. **Second device - hard disk** 2. Hard disk drive
RPL computer does not RPL from server	1. **Check startup sequence** 2. Check the network adapter LED status
Serial or parallel port device failure (system board port)	1. **External Device Self-Test OK?** 2. External Device 3. Cable 4. System Board
Serial or parallel port device failure (adapter port)	1. **External Device Self-Test OK?** 2. External Device 3. Cable 4. Alternate Adapter 5. System Board
Some or all keys on the keyboard do not work	1. **Keyboard** 2. Keyboard Cable 3. System Board

Undetermined problems

If this computer has a parallel ATA hard disk drive, make sure that the hard disk drive is jumpered as a master and the optical drive is jumpered as a slave.

1. Power-off the computer.
2. Remove or disconnect the following components (if installed) one at a time.
   a. External devices (modem, printer, or mouse)
   b. Any adapters
   c. Memory modules
   d. Extended video memory
   e. External Cache
   f. External Cache RAM
   g. Hard disk drive
   h. Diskette drive
3. Power-on the computer to re-test the system.
4. Repeat steps 1 through 3 until you find the failing device or adapter.

If all devices and adapters have been removed, and the problem continues, replace the system board.

Chapter 10. Replacing FRUs (Type 4105, 4157, 4217)

Important

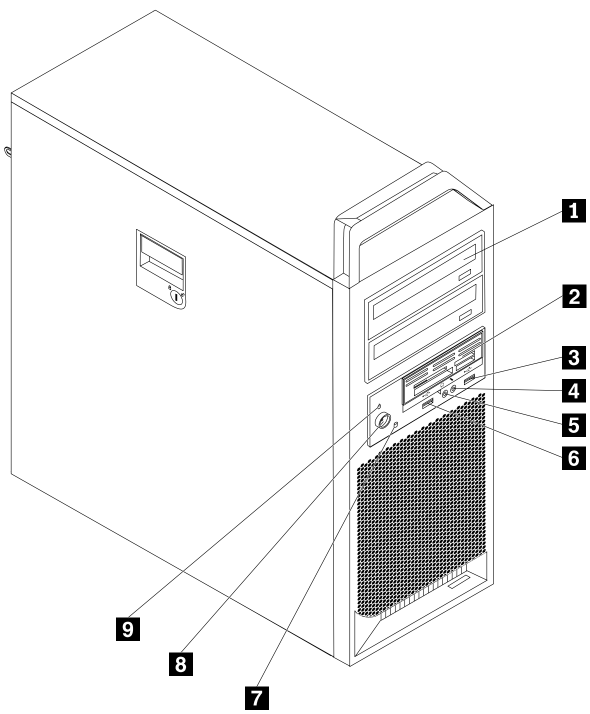
Before you replace any FRU, read Chapter 2 “Safety information” on page 3. These precautions and guidelines will help you work safely.

FRU replacements are to be done by trained service technicians only.

This chapter does not contain a remove and replace procedure for all FRUs. Only the major FRUs are documented.

Locating controls and connectors on the front of your computer

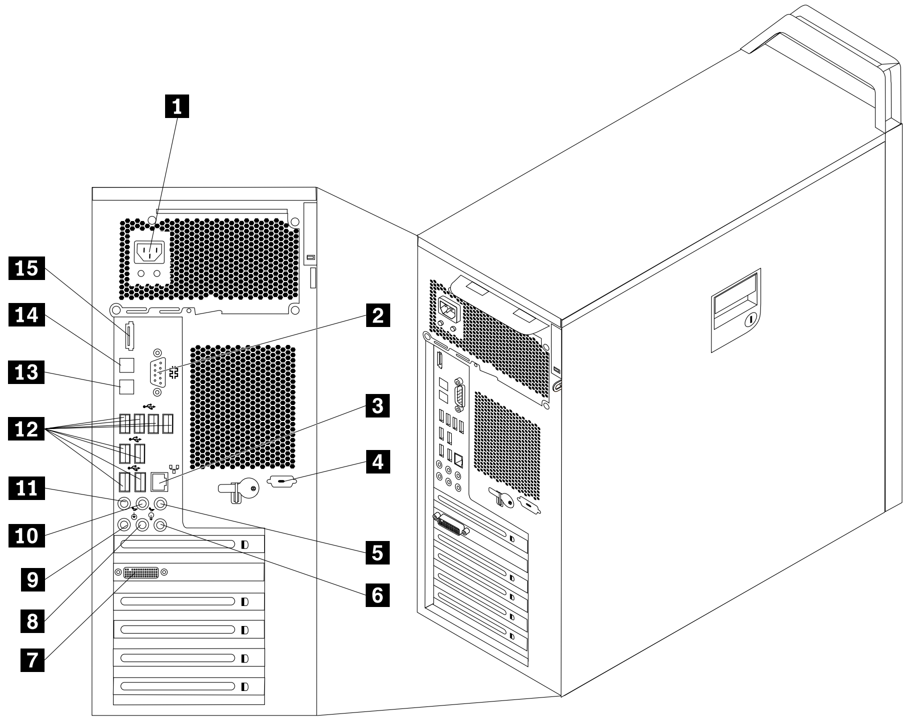
The following illustration shows the location of the controls and connectors on the front of your computer.



1	Optical drive (some models)	6	USB connector
2	3.5-inch diskette drive or card reader (some models)	7	Hard disk drive activity light
3	USB connector	8	Power button
4	Microphone connector	9	Power-on indicator
5	Headphone connector		

Rear connectors

The following illustration shows the locations of the connectors on the rear of the computer.



1	Power cord connector	9	Microphone connector
2	Serial port	10	Audio line-out rear speakers connector
3	Ethernet connector	11	SPDIF (Sony Philips Digital Interconnect Format) out connector
4	Serial port (some models)	12	USB connectors (8)
5	Audio line-out subwoofer/center speakers connector	13	Optical SPDIF in connector
6	Audio line-in connector	14	Optical SPDIF out connector
7	Video connector (some models)	15	eSATA connector
8	Audio line-out front speakers connector		

Removing the cover

CAUTION:

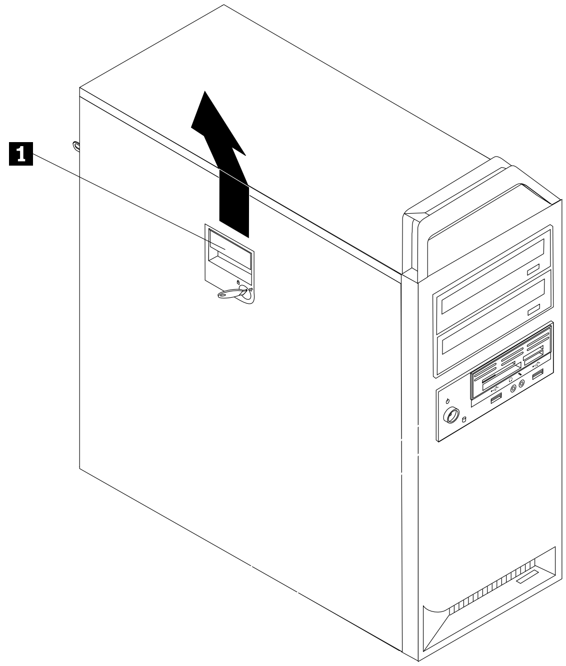


The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

To remove the computer cover:

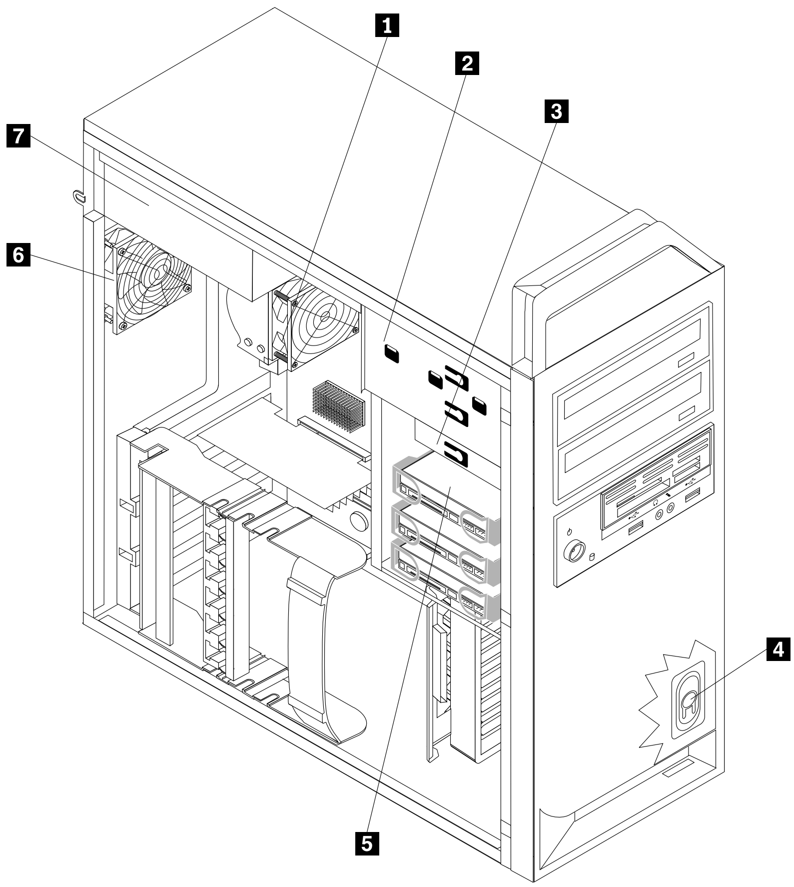
1. Remove any media from the drives and shut down your operating system. Turn off all attached devices. Turn off the computer.
2. Unplug all power cords from electrical outlets.
3. Disconnect the cables attached to the computer. This includes power cords, input/output (I/O) cables, and any other cables that are connected to the computer. See “Locating controls and connectors on the front of your computer” on page 77 and “Rear connectors” on page 77.
4. Remove any locking devices, such as a cable lock or padlock that secures the computer cover. Open the keylock if it is in the locked position.

5. Disengage the cover latch 1 and remove the cover. Place the cover on a flat surface.



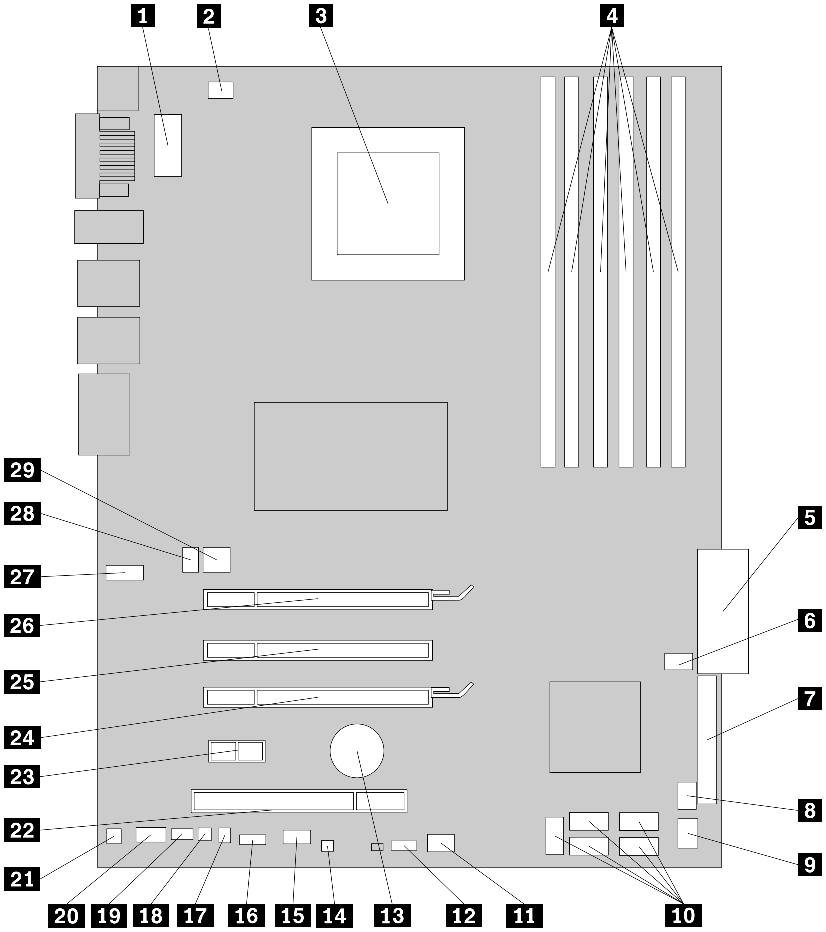
Locations

The following illustration will help you locate the major FRUs in the computer.



1	Microprocessor, heat sink, and heat sink fan assembly	5	Hard disk drives
2	Optical drive	6	Rear fan assembly
3	3.5-inch diskette drive or card reader	7	Power supply
4	Internal speaker		

Locating parts on the system board

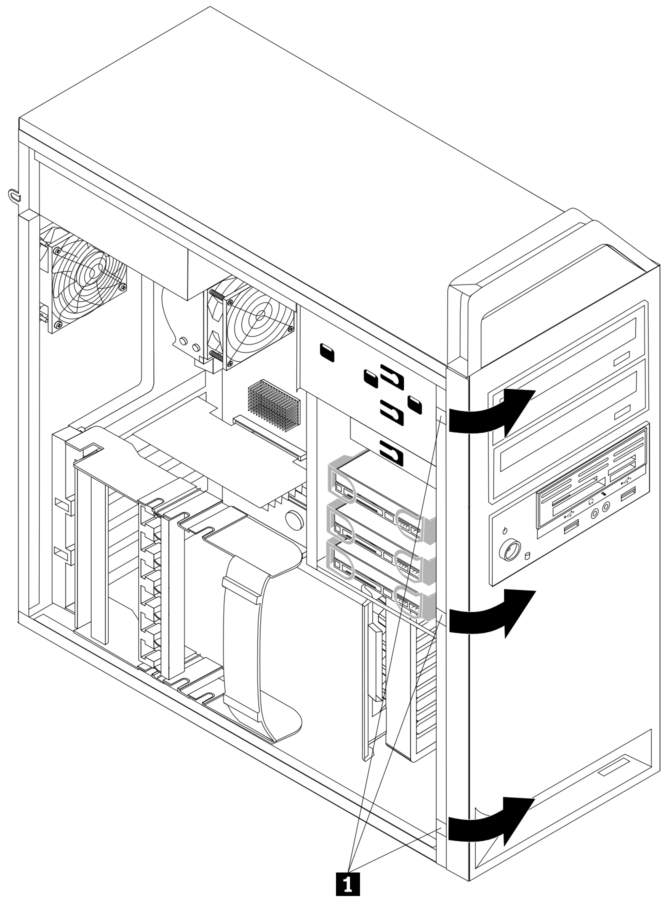


1	Microprocessor 12 V power connector	16	Front panel connector
2	Microprocessor fan connector	17	Cover presence switch connector
3	Microprocessor	18	Thermal sensor connector
4	Memory slots (6)	19	PS/2 connector
5	24-pin system power connector	20	Front audio connector
6	Hard disk drive fan assembly connector	21	Internal speaker connector
7	Diskette drive connector	22	PCI adapter card slot
8	Card reader connector	23	PCI Express x1 adapter card slot
9	Front USB connector	24	PCI Express x16 graphics adapter card slot
10	SATA connectors (5)	25	PCI Express x4 adapter card slot
11	Adapter card fan connector	26	PCI Express x16 graphics adapter card slot
12	SAS (Serial Attached SCSI) LED connector	27	Second COM port connector
13	Battery	28	Rear fan assembly connector
14	Clear CMOS/Recovery jumper	29	Auxiliary 12 V power connector
15	Auxiliary LED connector		

Removing the front bezel

To remove the front bezel:

1. Remove the cover. See "Removing the cover" on page 78.
2. Remove the front bezel by releasing the three plastic tabs **1** on the left side and pivoting the bezel outward.



3. Lay the front bezel on a flat surface.
4. To reinstall the bezel, align the plastic tabs on the right side of the bezel with the corresponding holes in the chassis, then pivot the bezel inward until it snaps into position on the left side.

Replacing the power supply

Attention

Never remove the cover on a power supply or any part that has the following label attached.



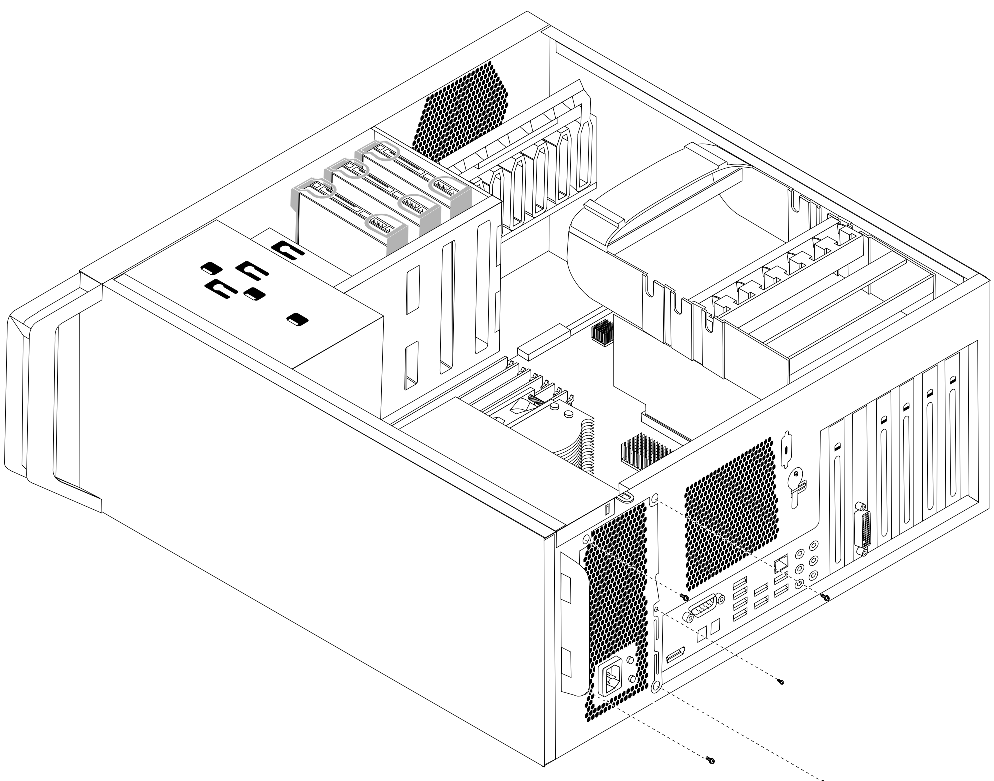
Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no servicable parts inside these components.

Attention
Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to: http://www.lenovo.com/support.

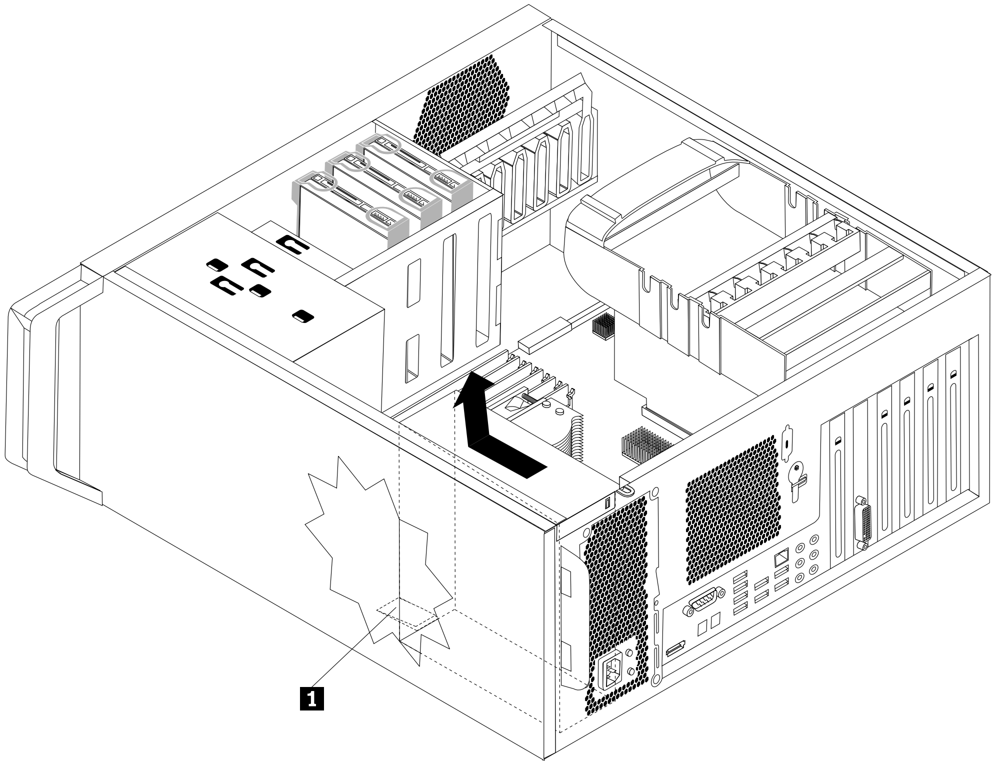
This section provides information on how to remove or replace the power supply.

To replace the power supply, do the following:

1. Remove the computer cover and then lay the computer on its side. See "Removing the cover" on page 78.
2. Locate the power supply assembly. See "Locations" on page 79.
3. Disconnect the power supply cables from the system board connectors. Disconnect the power supply cables from all adapter cards (some models) and from all drives.
4. Remove the power supply cables from the cable clips and ties.
5. Remove the five screws at the rear of the chassis that secure the power supply.



6. Depress the power supply latch **1**. Slide the power supply assembly toward the front of the computer and remove it from the chassis.



7. Ensure that the new power supply is the correct replacement. Some power supplies automatically sense the voltage, some power supplies are voltage specific, and some power supplies have a voltage-selection switch. If there is a voltage-selection switch, use a ballpoint pen to slide the switch, if necessary.

   Note: For models that have a switch:

   - If the voltage supply range is 100–127 V AC, set the switch to 115 V.
   - If the voltage supply range is 200–240 V AC, set the switch to 230 V.

8. Install the new power supply into the chassis so that the screw holes in the power supply align with those in the chassis.

   Note: Use only the screws provided by Lenovo.

9. Install and tighten the five screws at the rear of the chassis to secure the power supply. Reconnect all power supply cables to the drives, adapter cards, and the system board. Make sure to reconnect the power cable to the graphics cards that require an additional cable.

10. Go to “Completing the FRU replacement” on page 108.

Replacing a memory module

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

CAUTION:



The memory module might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

This section provides instructions on how to replace a memory module.

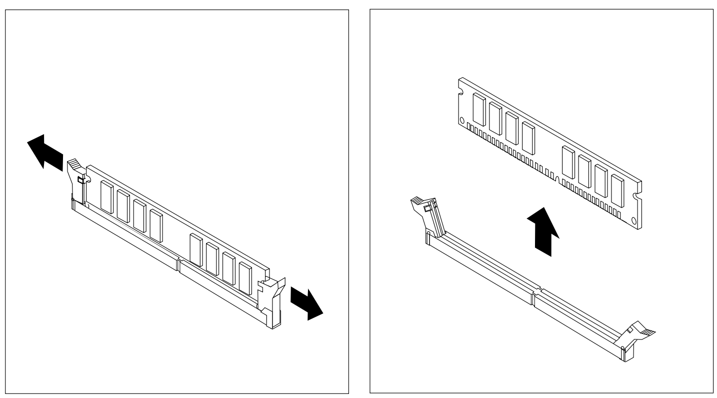
Your computer has 6 slots for installing or replacing DDR3 UDIMMs (double data rate 3 error correction code unbuffered dual inline memory modules).

When installing or replacing memory modules, use the following guidelines:

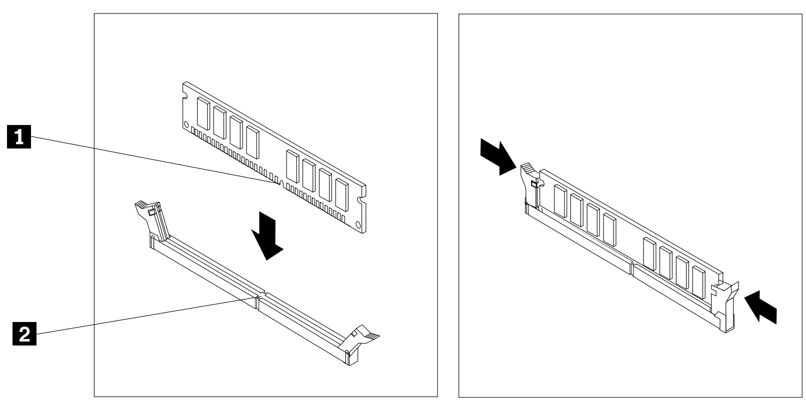
- Always install DIMMs in the numerical order printed on the system board (DIMM1, DIMM2, DIMM3, and so on).
- Install memory modules into the blue memory slots first. Install memory modules into the black memory slots only after all the blue memory slots are occupied.
- Be sure to install memory modules starting with the memory slots adjacent to the CPU.

To remove or replace the memory module, do the following:

1. Remove the computer cover. See "Removing the cover" on page 78.
2. Locate the memory module slots. See "Locating parts on the system board " on page 81.
3. Remove the memory module being replaced by opening the retaining clips.



4. Position the replacement memory module over the memory slot. Make sure the notch **1** on the memory module aligns correctly with the slot key **2** on the system board. Push the memory module straight down into the slot until the retaining clips close. See "Installing or replacing a memory module" on page 116.



5. Go to “Completing the FRU replacement” on page 108.

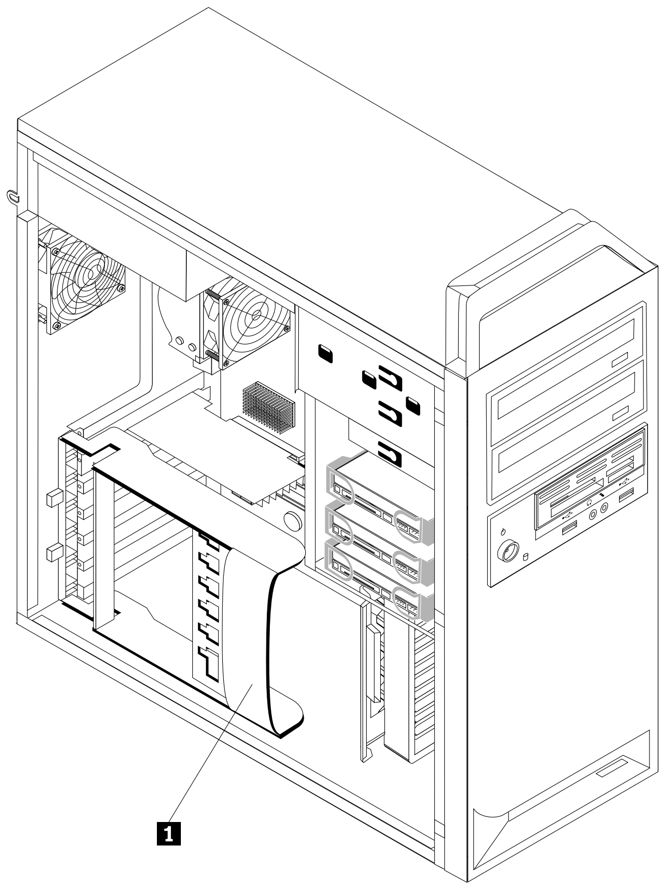
Replacing a PCI adapter card

> **Attention**
>
> Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
> http://www.lenovo.com/support.

This section provides information on how to remove or replace a PCI adapter card.

To remove or replace the PCI adapter card, do the following:

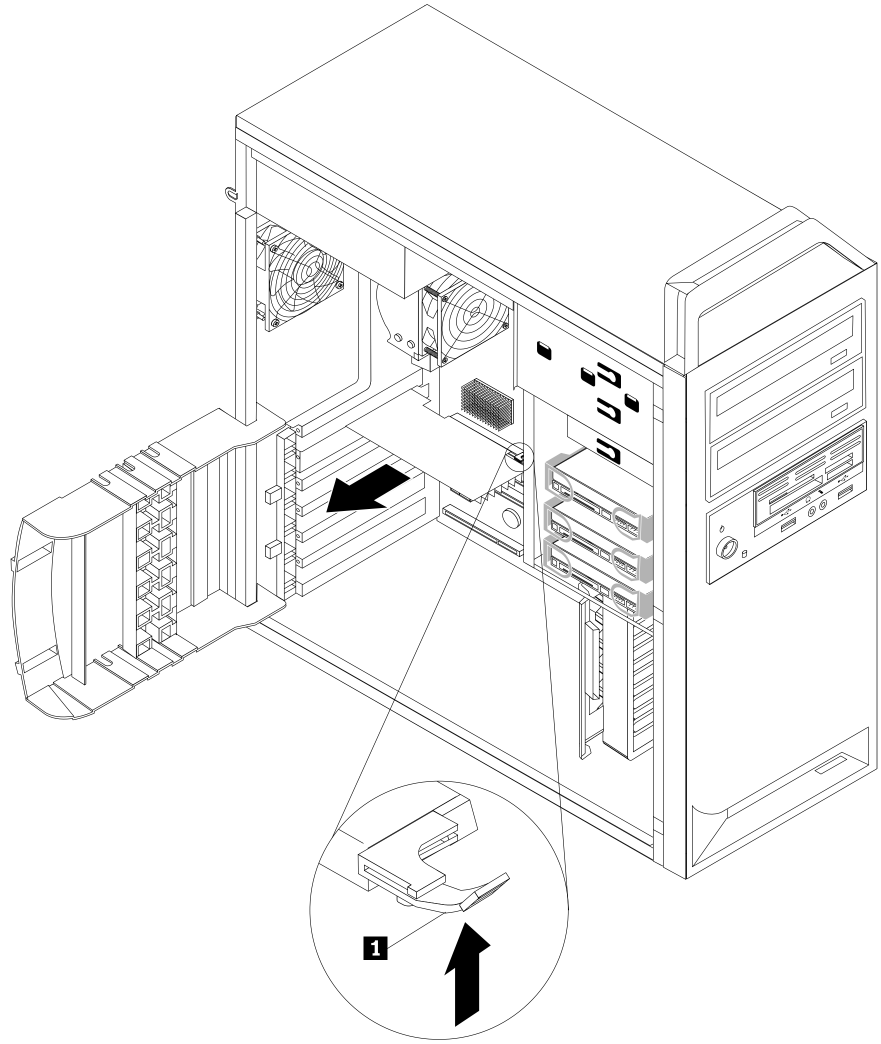
1. Remove the computer cover. See “Removing the cover” on page 78.
2. Unlatch and open the adapter card retainer **1**.

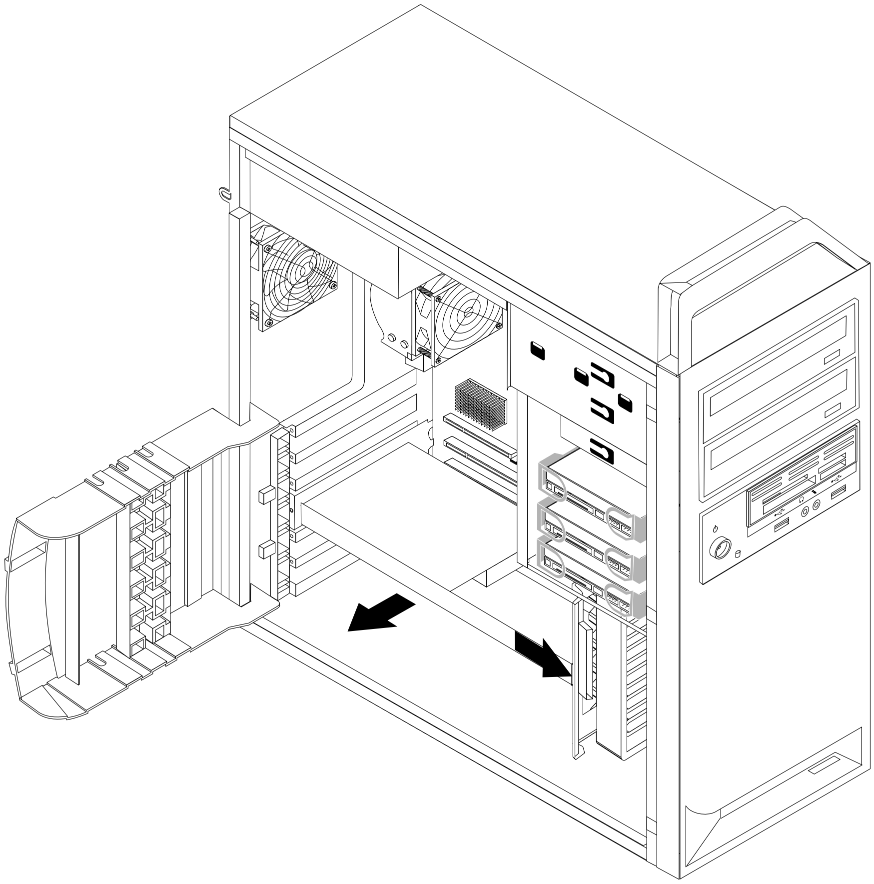


3. Take note of the location of all cable connections on the adapter card. It will be necessary to reconnect them properly when installing a new adapter card.
4. Disconnect all cables connected to the adapter card. See “Locating parts on the system board ” on page 81.
5. Some models have:
   - A screw installed in the adapter bracket, remove this screw.
   - An additional retention feature located on the card guide end. Push the retention feature toward the front of the chassis before removing the adapter card.

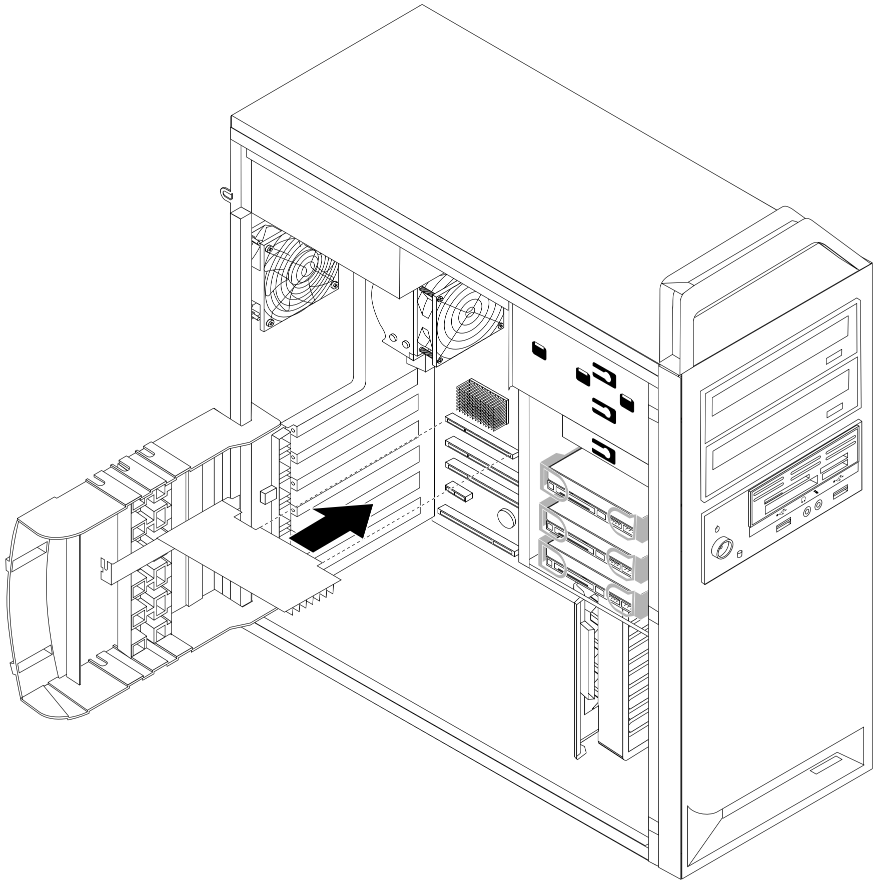
6. Release the adapter card support retaining latch **1** if necessary. Grasp the failing adapter card and pull the adapter card out of the slot.

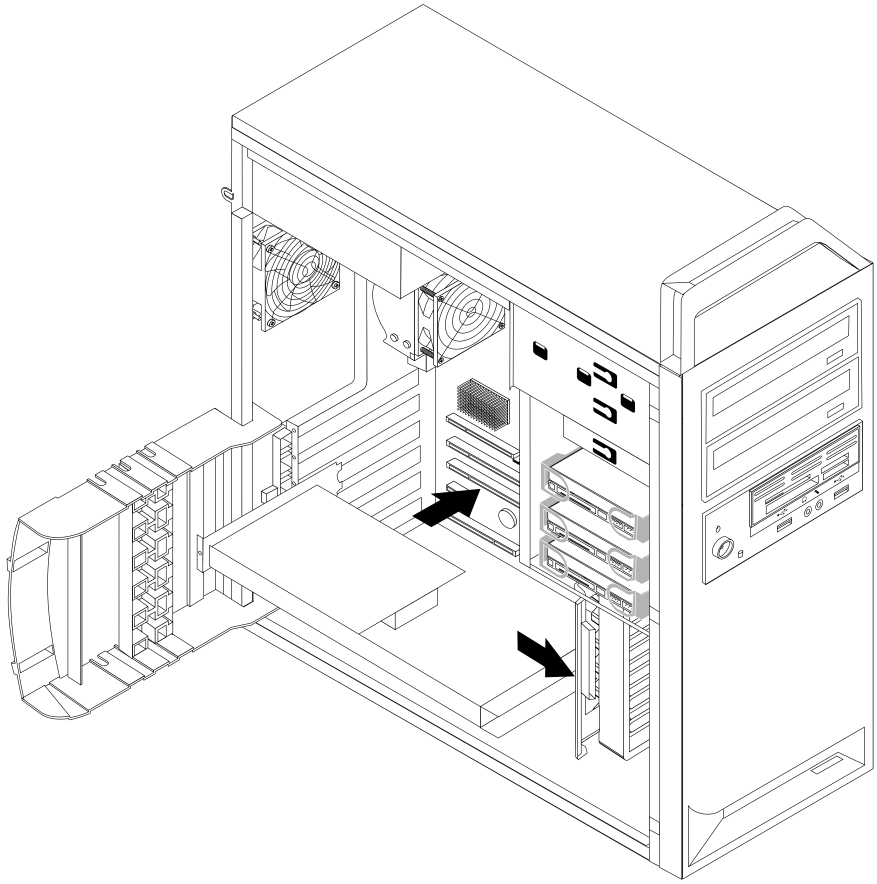
   Note: The adapter card fits tightly into the card slot. If necessary, alternate moving each side of the adapter card a small amount until it is removed from the adapter card slot.





7. Remove the new adapter card from its static-protective package.
8. Install the new adapter card into the appropriate adapter card slot on the system board. See “Locating parts on the system board ” on page 81.





9. Connect any adapter card cables to the system board.
10. Latch the adapter card retainer.
11. Go to "Completing the FRU replacement" on page 108.

Replacing the heat sink

CAUTION:

**The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.**

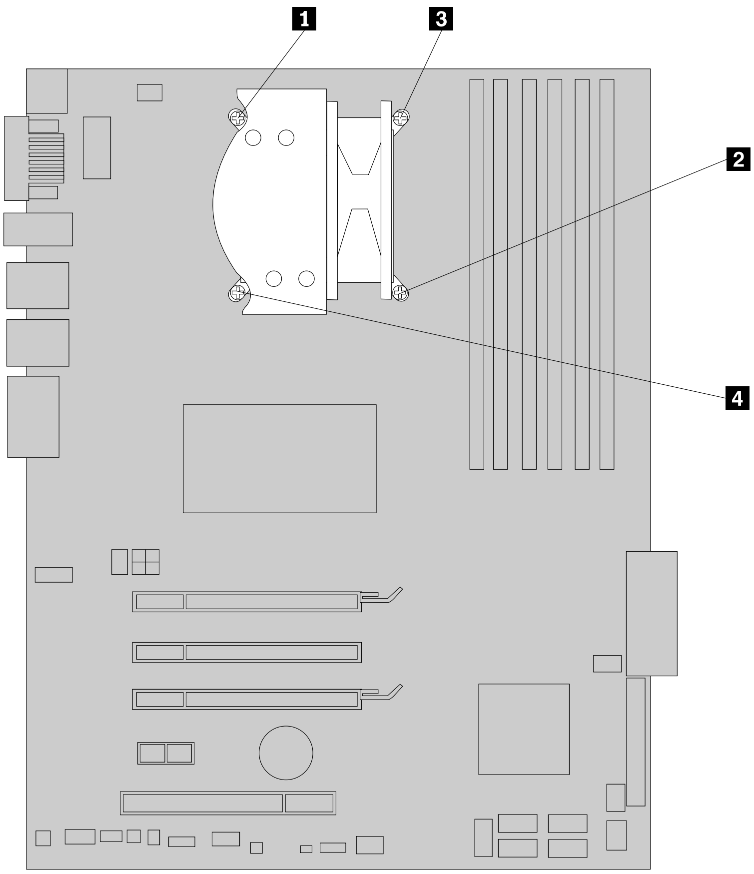
> **Attention**
>
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> http://www.lenovo.com/support.

This section provides instructions on how to replace and install the heat sink.

To replace the heat sink:

1. Open the computer cover. See "Removing the cover" on page 78.
2. Lay the computer on its side for easier access to the heat sink.

3. Remove the heat sink and fan assembly cable from the system board. Note the cable location. See "Locating parts on the system board " on page 81.
4. Follow this sequence to remove the heat sink from the system board:
   a. Partially remove screw **1**, then fully remove screw **2**, and fully remove screw **1**.
   b. Partially remove screw **3**, then fully remove screw **4**, and fully remove screw **3**.



5. Carefully lift the heat sink off of the system board.
6. Remove the plastic cover from the bottom of the new heat sink to expose the heat sink grease (this cover protects the heat sink grease from contamination).

   Notes:

   a. Do not remove the plastic cover until you are ready to install the heat sink and fan assembly on the microprocessor. Do not touch the grease on the heat sink and fan assembly. Do not put the heat sink and fan assembly anywhere except on the microprocessor after the plastic cover has been removed and the grease exposed.
   b. Some heat sink part numbers will have orientation labels showing "Front of System." Heat Sinks that do not have orientation labels should be oriented so the fan cable is toward the board connector labeled "CPU Fan."
7. Place the new heat sink into position.

   Important: Do not touch the thermal grease while handling the heat sink.
8. Align the four screws on the heat sink with the four mounting studs in the chassis.
9. Follow this sequence to install the screws, noting that fully tight is 5 in-lbs +/- 0.5 in-lbs:
   a. Partially tighten screw **1**, then fully tighten screw **2**, and fully tighten screw **1**.
   b. Partially tighten screw **3**, then fully tighten screw **4**, and fully tighten screw **3**.

10. Reconnect the heat sink fan cable. See “Locating parts on the system board ” on page 81.
11. Go to “Completing the FRU replacement” on page 108.

Replacing the microprocessor

CAUTION:

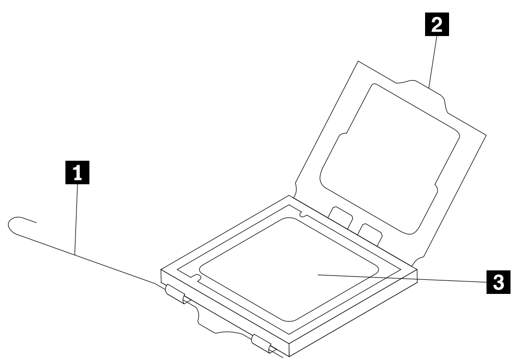
The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

> **Attention**
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This section provides instructions on how to replace the microprocessor.

To replace the microprocessor:

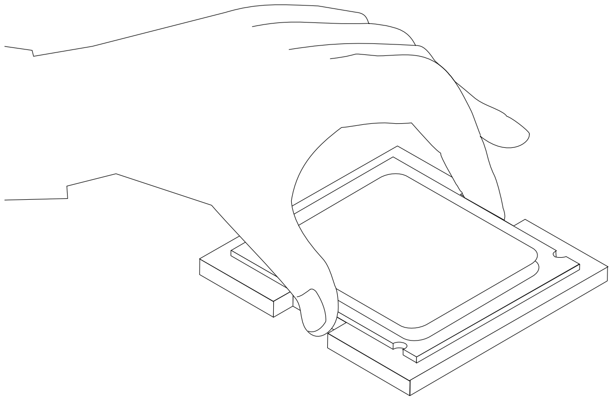
1. Open the computer cover. See “Removing the cover” on page 78.
2. Place the computer on its side to help make the system board more accessible.
3. Remove the heat sink from the system board. See “Replacing the heat sink” on page 90.
4. To remove the microprocessor **3** from the system board, lift the small handle **1** and open the retainer **2**.



Important

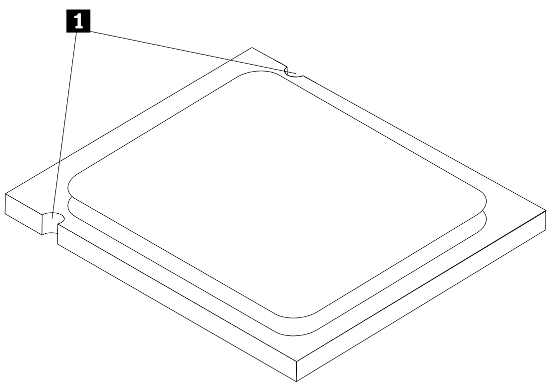
Touch only the sides of the microprocessor. Do not touch the gold contacts on the bottom.

5. Lift the microprocessor straight up and out of the socket.



Notes:

a. Note the orientation of the notches **1** on the microprocessor. This is important when reinstalling the microprocessor on the new system board.



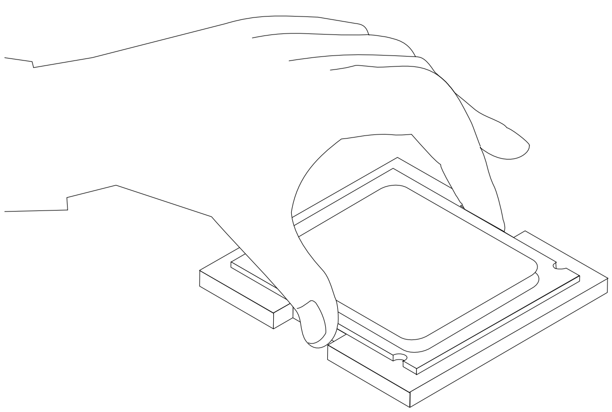
b. Do not drop anything onto the microprocessor socket while it is exposed. The socket pins must be kept as clean as possible.

6. Holding the microprocessor with your fingers, position the microprocessor so that the notches on the microprocessor are aligned with the tabs in the microprocessor socket.

Important

To avoid damaging the microprocessor contacts, do not tilt the microprocessor when installing it into the socket.

7. Lower the microprocessor straight down into the microprocessor socket of the system board.



8. Close the microprocessor retainer and clamp it with the small handle.

9. Place the heat sink into position and replace the 4 screws to secure the heat sink to the system board.
10. Reconnect the heat sink fan cable.
11. Go to "Completing the FRU replacement" on page 108.

Replacing the system board

CAUTION:

The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

Attention

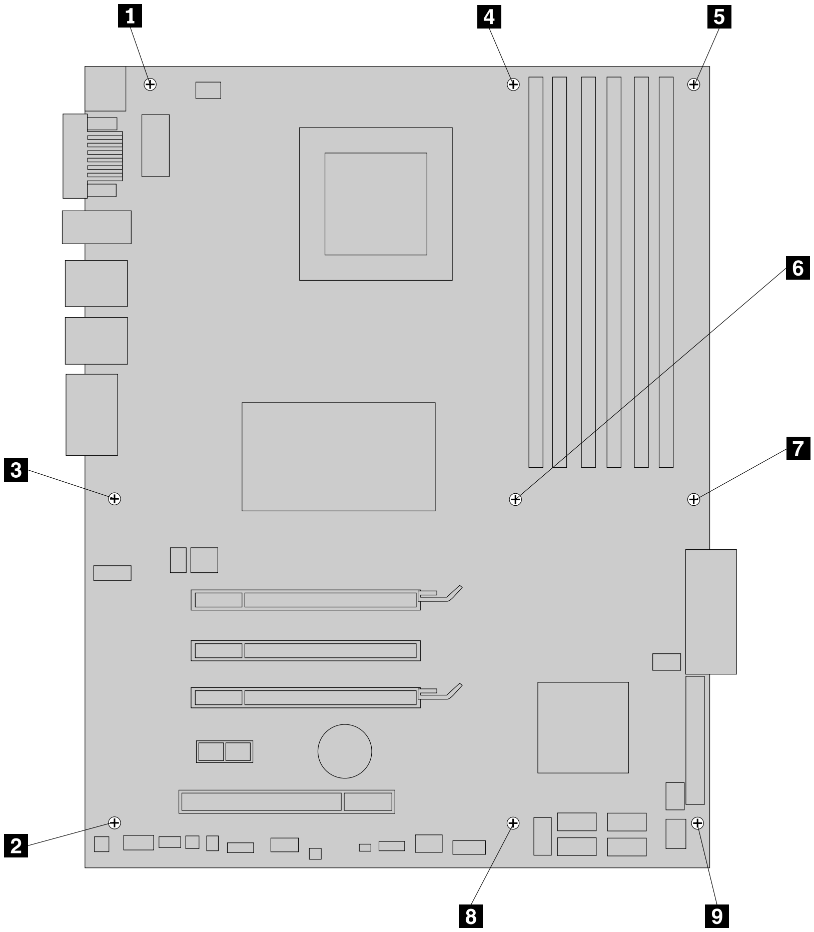
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Note: When replacing the system board a new retention module for the microprocessor heat sink is required. Make sure you have a new retention module before beginning this procedure.

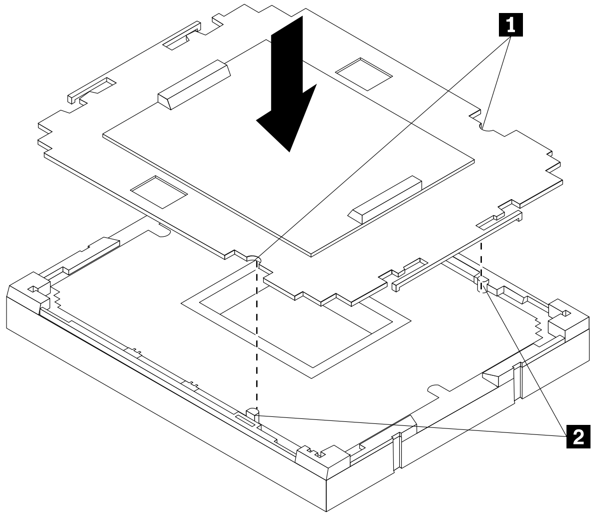
This section provides instructions on how to remove and install the system board.

To replace the system board:

1. Open the cover. See "Removing the cover" on page 78.
2. Lay the computer on its side for easier access to the system board.
3. Remove any adapter cards installed in the PCI connectors. See "Replacing a PCI adapter card" on page 86.
4. Remove the hard disk drive fan. See "Replacing the hard disk drive fan assembly" on page 100.
5. Remove the memory modules from the failing system board.
6. Remove the heat sink from the failing system board. See "Replacing the heat sink" on page 90.
7. Note the location of all cable connections on the system board and disconnect all cables. See "Locating parts on the system board " on page 81.
8. Remove the nine screws that secure the system board to the chassis, following the sequence shown in the figure:

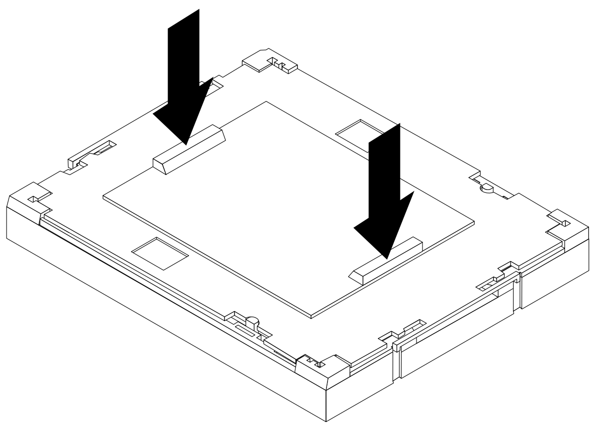


9. Carefully lift the system board out of the chassis.
10. Remove the microprocessor socket cover from the new system board.
11. Remove the microprocessor from the failing system board and install it on the new system board. See "Replacing the microprocessor" on page 92.
12. The failing system board must be returned with a microprocessor socket cover to protect the pins during shipping and handling. Install the microprocessor socket cover removed from the new system board on the failing system board. To install the microprocessor socket cover:
    a. Release the lever securing the microprocessor retainer and open the retainer to access the microprocessor.
    b. Grasp the microprocessor on the sides and lift it straight up and out of the socket. Do not touch the contacts on the microprocessor socket.
    c. Align the notches **1** of the microprocessor socket cover with the alignment keys **2** of the microprocessor socket. Lower the socket cover straight down into the microprocessor socket on the system board.



Note: Your microprocessor socket and cover might look slightly different from the illustration.

d. Carefully press the socket cover straight downwards until it is secured into the socket.



e. Lower the microprocessor retainer and then lower the lever to secure the retainer. Make sure the lever is securely locked into position.
f. Follow any additional instructions included with the replacement part you received.

13. Install the new system board into the chassis and align the screw holes with those in the chassis. Insert and tighten the screws that secure the system board following the sequence shown in the figure above.
14. Install the memory modules in the same location on the new system board.
15. Install the microprocessor on the new system board. See “Replacing the microprocessor” on page 92
16. Install the heat sink and fan assembly on the new system board. See “Replacing the heat sink” on page 90.
17. Connect the heat sink and fan assembly cable to the new system board. See “Locating parts on the system board ” on page 81.
18. Install the hard disk drive fan. See “Replacing the hard disk drive fan assembly” on page 100.
19. Connect all cables to the system board. See the system board illustration for your machine type at “Locating parts on the system board ” on page 81.
20. Go to “Completing the FRU replacement” on page 108.

Replacing a hard disk drive

Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

This section provides instructions on how to replace a hard disk drive.

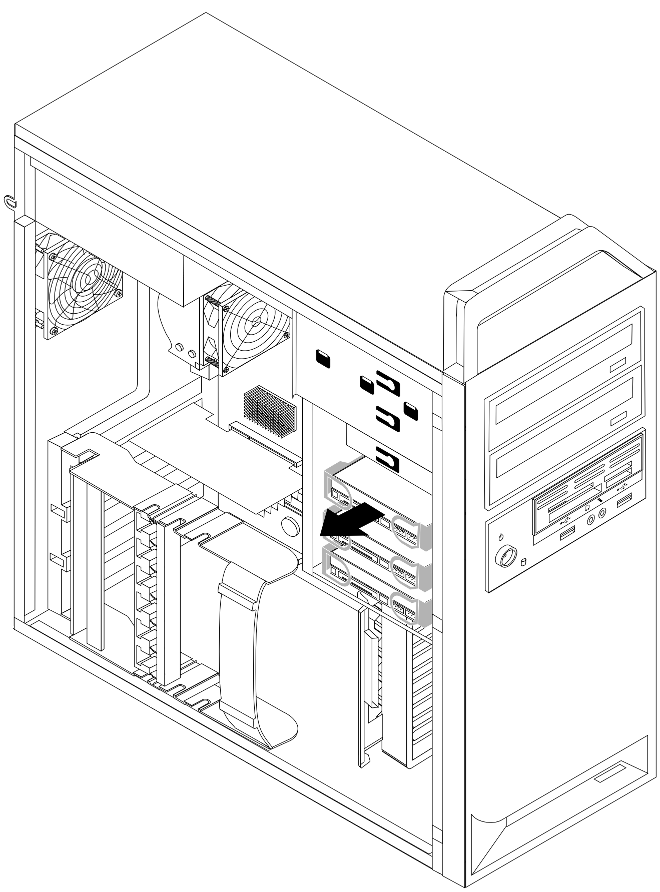
Important

When you receive a new hard disk drive, you also receive a set of *Product Recovery discs*. The set of *Product Recovery discs* will enable you to restore the contents of the hard disk drive to the same state as when your computer was originally shipped from the factory. For more information on recovering factory-installed software, refer to "Recovering software" in your *ThinkStation User Guide*.

Attention: Your computer supports both SAS hard disk drives and SATA hard disk drives. However, be sure that you do not install both the SAS and SATA hard disk drives into the same computer.

To replace a hard disk drive, do the following:

1. Remove the computer cover. See "Removing the cover" on page 78.
2. Locate the hard disk drive. See "Locations" on page 79.
3. Disconnect the signal and power cables from the hard disk drive.
4. Pull the bracket handle out to remove the hard disk drive from the chassis.



5. Remove the failing hard disk drive from the bracket by flexing the bracket.
6. To install the new hard disk drive into the bracket, flex the bracket, and then align pin **1**, pin **2**, pin **3**, and pin **4** on the bracket with the holes in the hard disk drive. Do not touch the circuit board **5** on the bottom of the hard disk drive.

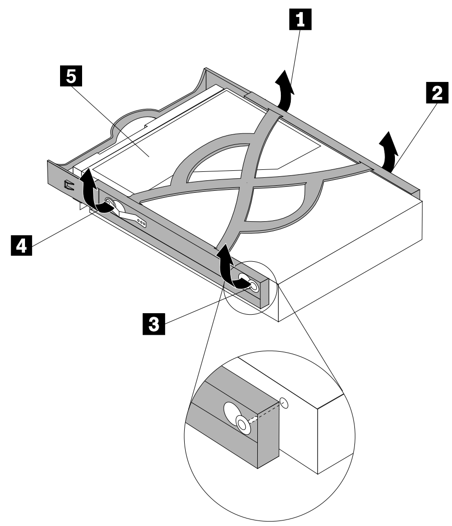


Figure 1. Installing a 3.5-inch hard disk drive into the bracket

Note: If you are installing a 2.5-inch hard disk drive into the bracket, flex the bracket, and then align pin **1**, pin **2**, pin **3**, and pin **4** on the bracket with the holes in the hard disk drive adapter **5**.

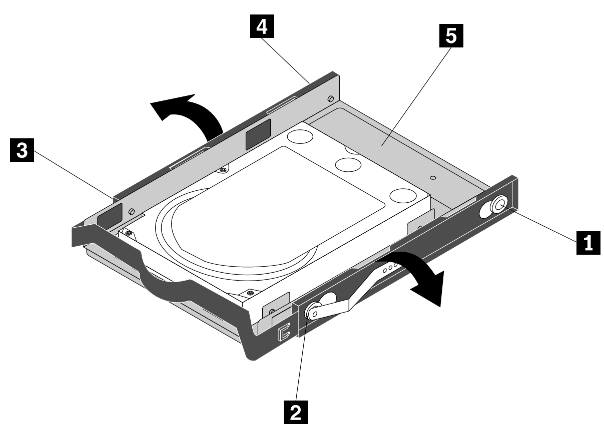


Figure 2. Installing a 2.5-inch hard disk drive into the bracket

7. Install the hard disk drive and bracket into the drive bay.
8. Using the signal cable that came with the new drive, connect one end of the signal cable to the drive. Locate one of the extra five-wire power cables and connect it to the drive.

   Note: The signal cable will be different depending on whether you are installing a SATA hard disk drive or a SAS hard disk drive.

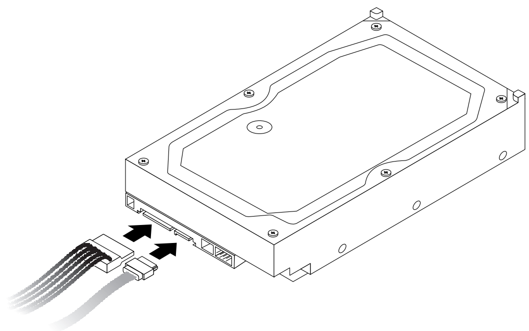


Figure 3. Connecting a 3.5-inch SATA hard disk drive

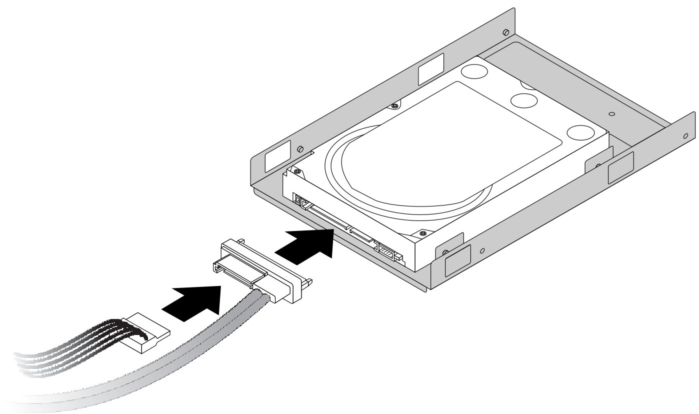


Figure 4. Connecting a 2.5-inch SATA hard disk drive

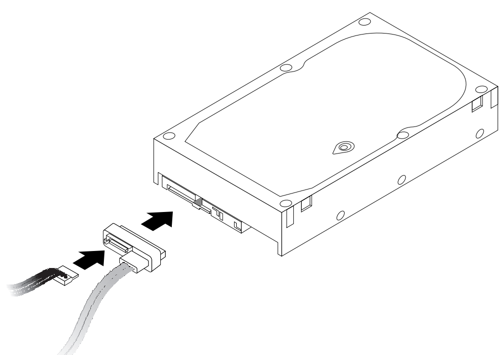


Figure 5. Connecting a 3.5-inch SAS hard disk drive

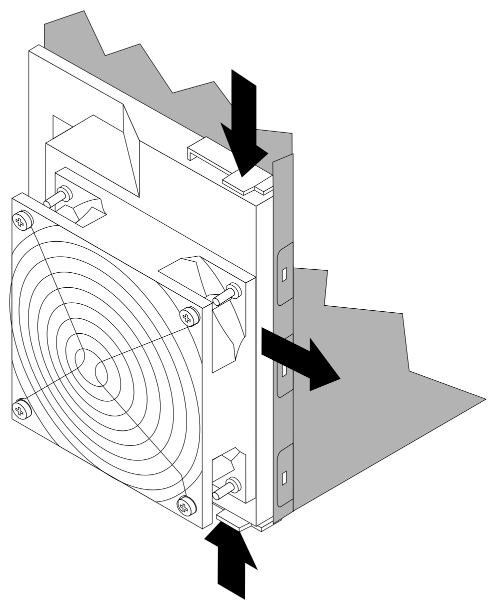
9. Go to “Completing the FRU replacement” on page 108.

Replacing the hard disk drive fan assembly

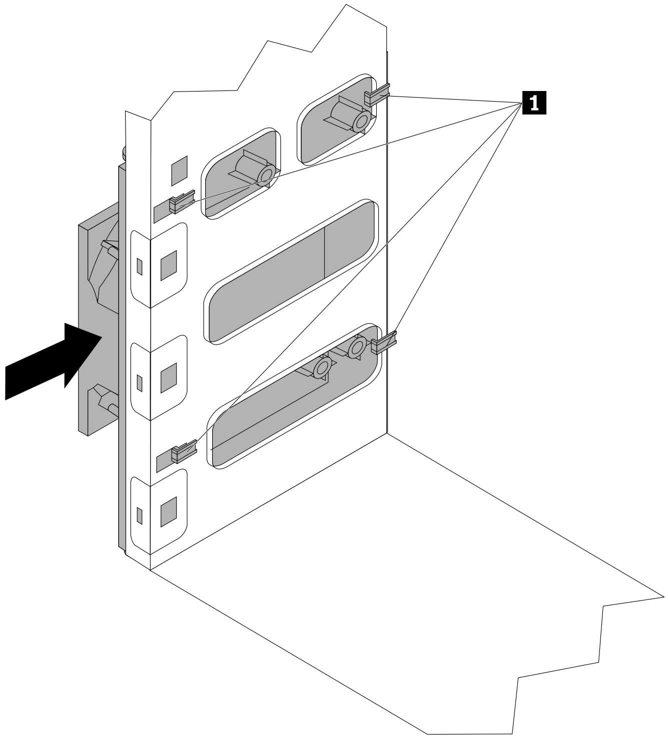
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Your computer might have a hard disk drive fan assembly installed. To replace the hard disk drive fan assembly:

1. Remove the computer cover. See "Removing the cover" on page 78.
2. Locate the hard disk drive fan assembly. The hard disk drive fan assembly is attached to the side of the hard disk drive bay.
3. Disconnect the hard disk drive fan assembly cable from the system board. See "Locating parts on the system board " on page 81.
4. Press the two latches on the hard disk drive fan assembly bracket and then slide the fan assembly bracket free from the chassis.



5. Connect the new hard disk drive fan assembly cable to the hard disk drive fan assembly connector on the system board.
6. Install the new hard disk drive fan assembly bracket into the chassis by aligning the four latches **1** on the bracket with the corresponding holes in the chassis and pushing the bracket inward until it snaps into position.



7. Go to “Completing the FRU replacement” on page 108.

Replacing an optical drive

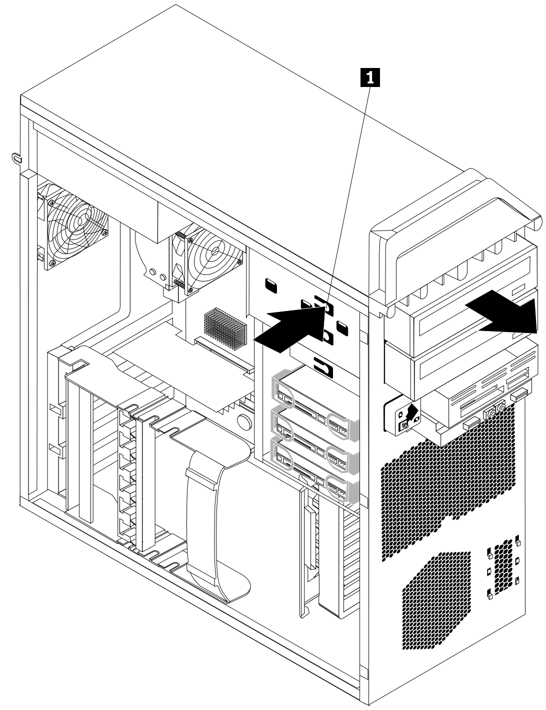
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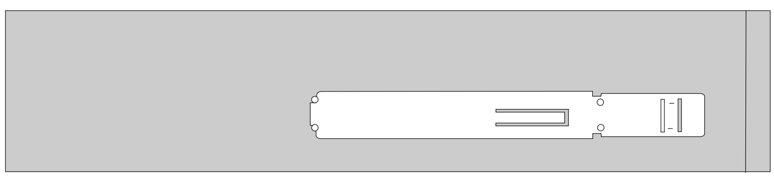
This section provides instructions on how to replace an optical drive.

To remove or replace the optical drive, do the following:

1. Remove the computer cover. See “Removing the cover” on page 78.
2. Remove the front bezel. See “Removing the front bezel” on page 82.
3. Locate the optical drive. See “Locations” on page 79.
4. Note the location of the optical drive cables. Disconnect the signal and power cables from the rear of the optical drive.
5. Press the drive latch **1** (for the drive you want to remove) and slide the optical drive from the chassis.



6. Remove the retainer bracket from the drive being replaced and install it on the new drive.



7. Slide the new optical drive into the bay from the front until it snaps into position.
8. Reconnect the signal and power cables to the new drive.
9. Go to "Completing the FRU replacement" on page 108.

Replacing the diskette drive or card reader

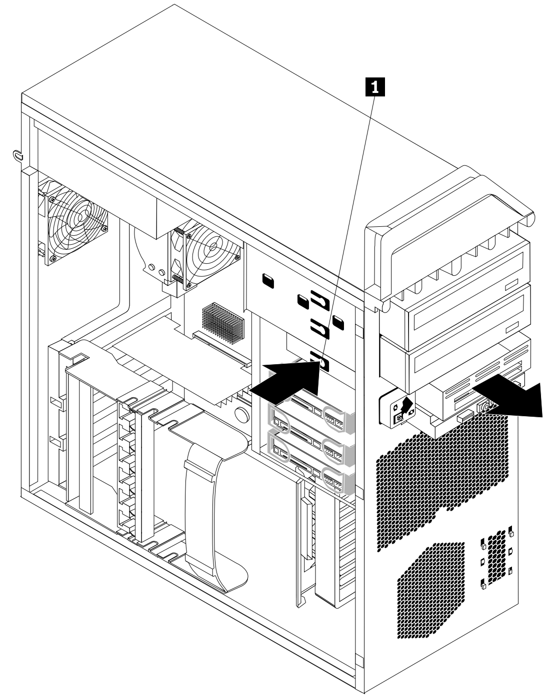
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This section provides instructions on how to replace the diskette drive or card reader.

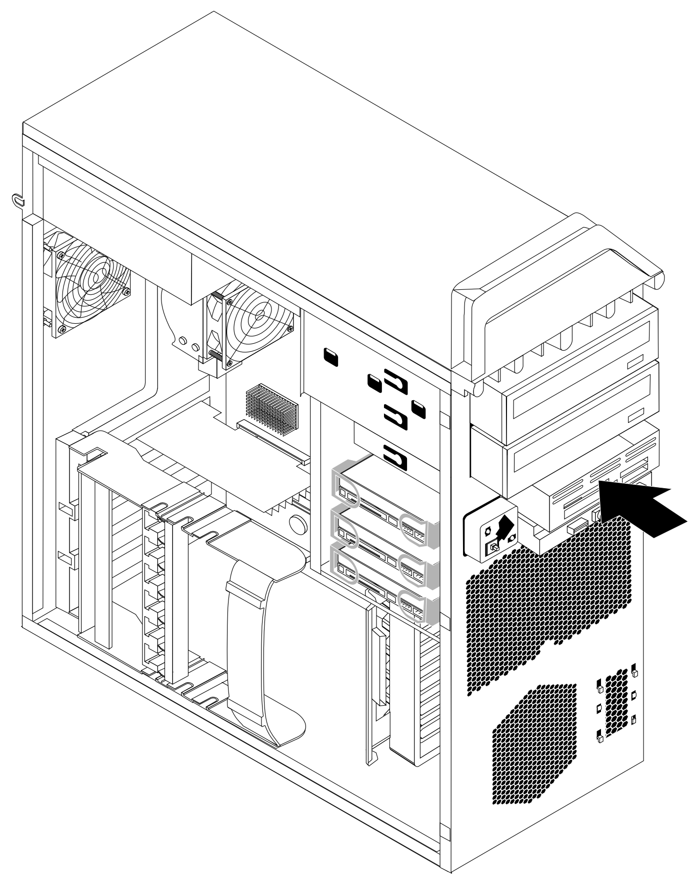
To remove or replace the diskette drive or card reader, do the following:

1. Remove the computer cover. See "Removing the cover" on page 78.
2. Remove the front bezel. See "Removing the front bezel" on page 82.
3. Locate the diskette drive or card reader. See "Locations" on page 79.
4. Disconnect the signal and power cables from the rear of the diskette drive. If you are replacing a card reader, disconnect the card reader cable from the system board. See "Locating parts on the system board " on page 81.

5. Press the drive latch **1** and slide the drive out the front of the computer.



6. Slide the new diskette drive or card reader into the drive bay until it snaps into position.



7. Connect the signal cable and power cable to the new diskette drive. If you are installing a card reader, connect the card reader cable to the card reader connector on the system board. See "Locating parts on the system board " on page 81.
8. Go to "Completing the FRU replacement" on page 108.

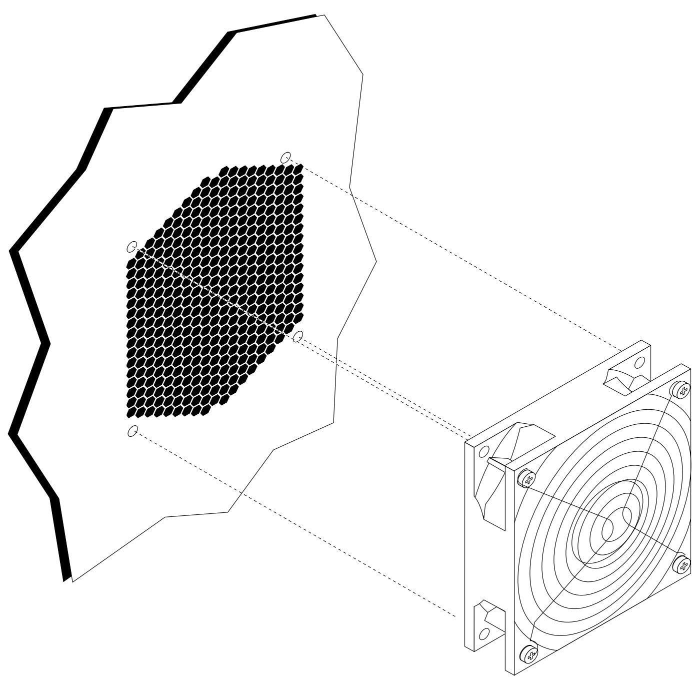
Replacing the front and rear fan assemblies

> **Attention**
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This section provides instructions on how to replace the front or rear fan assembly.

To remove or replace the front or rear fan assembly, do the following:

1. Remove the computer cover. See "Removing the cover" on page 78.
2. Locate the fan assembly that you want to replace. Your computer has one front fan assembly and one rear fan assembly. See "Locations" on page 79.
3. Remove the front bezel if you are replacing the front fan assembly. See "Removing the front bezel" on page 82.
4. Disconnect the fan assembly cable from the system board. See "Locating parts on the system board " on page 81.
5. The fan assembly is attached to the chassis by four rubber mounts. Carefully remove the four rubber mounts by breaking them or cutting them with scissors and then remove the fan assembly out of the chassis.



6. Install the new fan assembly by aligning the four rubber mounts of the fan assembly with the holes on the chassis and push the rubber mounts through the holes.
7. Pull on the tips of the rubber mounts until the fan assembly is in place.

8. Depending on which fan assembly you are replacing, reconnect the fan assembly cable to the adapter card fan assembly connector or the rear fan assembly connector on the system board. See “Locating parts on the system board ” on page 81.
9. If you are installing the hard disk drive fan assembly, reinstall the front bezel.
10. Go to “Completing the FRU replacement” on page 108.

Replacing the front panel connectors assembly

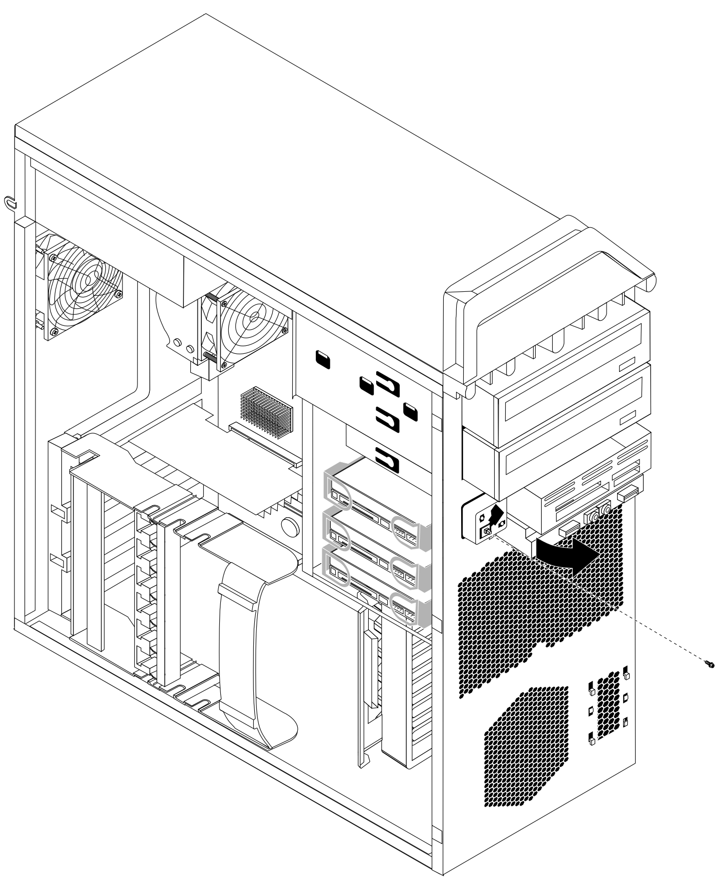
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This section provides instructions on how to replace the front panel connectors assembly.

To remove or replace the front panel connectors assembly, do the following:

1. Remove the computer cover. See “Removing the cover” on page 78.
2. Remove the front bezel. See “Removing the front bezel” on page 82.
3. Locate the front panel connectors assembly.
4. Disconnect the front audio, front USB, and auxiliary LED cables from the system board and note the cables routing. See “Locating parts on the system board ” on page 81.
5. Remove the screw that secures the front panel connectors assembly to the chassis. Rotate the assembly to release it completely from the chassis.



6. Install the new front panel connectors assembly into the chassis and secure it with the screw.
7. Reconnect the cables to the system board.
8. Go to "Completing the FRU replacement" on page 108.

Replacing the power switch/LED assembly

Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
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This procedure describes how to remove and replace the power switch/LED assembly.

1. Remove the computer cover. See "Removing the cover" on page 78.
2. Remove the front bezel. See "Removing the front bezel" on page 82.
3. Disconnect the power switch/LED assembly cable from the system board. See "Locating parts on the system board " on page 81.
4. Note the power switch/LED assembly cable routing and the position of the two LEDs.
5. Remove the switch and the LEDs from the bezel.
6. Route the cable for the new power switch/LED assembly through the hole in the chassis and to the system board.
7. Install the new power switch/LED assembly into the bezel. Make sure that the LEDs are in the correct position.
8. Connect the power switch/LED cable to the system board.
9. Reinstall the front bezel.
10. Go to "Completing the FRU replacement" on page 138.

Replacing the battery

Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
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Your computer has a special type of memory that maintains the date, time, and settings for built-in features, such as serial-port assignments (configuration). A battery keeps this information active when you turn off the computer.

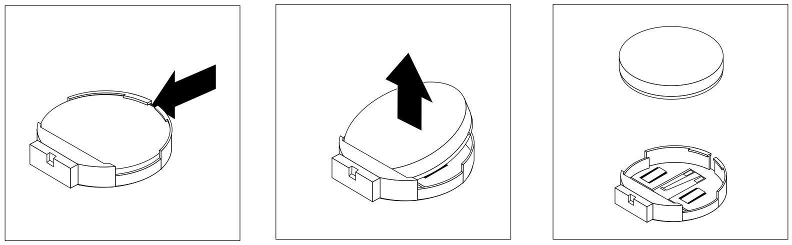
The battery normally requires no charging or maintenance throughout its life; however, no battery lasts forever. If the battery fails, the date, time, and configuration information (including passwords) are lost. An error message is displayed when you turn on the computer.

This section provides information on how to replace the battery.

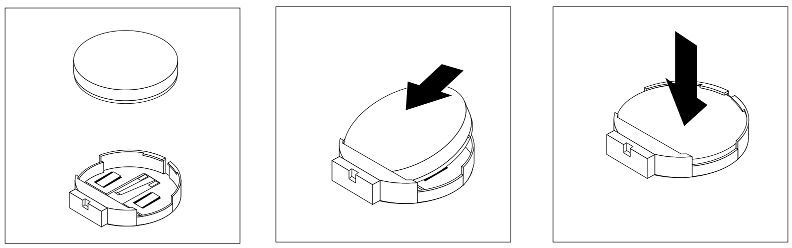
To change the battery, do the following:

1. Open the computer cover. See "Removing the cover" on page 78.
2. Access the system board.
3. Locate the battery. See "Locating parts on the system board " on page 81.

4. Remove the old battery.



5. Install the new battery.



6. Replace the computer cover and connect the cables. See “Completing the FRU replacement” on page 108.

   Note: When the computer is turned on for the first time after battery replacement, an error message might be displayed. This is normal after replacing the battery.

7. Turn on the computer and all attached devices.
8. Use the Setup Utility program to set the date and time and any passwords.
9. Go to “Completing the FRU replacement” on page 108.

Replacing the internal speaker

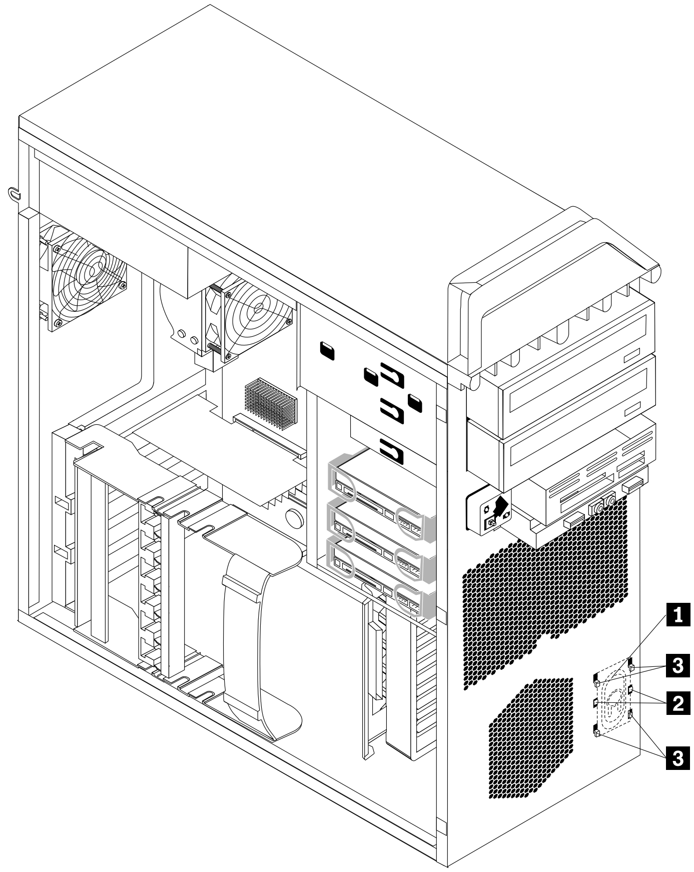
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http://www.lenovo.com/support.

This section provides instructions on how to replace the internal speaker.

To remove or replace the internal speaker, do the following:

1. Remove the computer cover. See “Removing the cover” on page 78.
2. Remove the front bezel. See “Removing the front bezel” on page 82.
3. Locate the internal speaker connector on the system board. See “Locations” on page 79.
4. Note the location of the internal speaker cable connection. Note the routing of the internal speaker cable. Disconnect the internal speaker cable from the system board. See “Locating parts on the system board ” on page 81.
5. Use a blunt instrument (such as, the top of a ball point pen) to disengage one of the internal speaker locking tabs **2** and slide that side of the speaker **1** upward enough to keep the locking tab disengaged. Then disengage the other internal speaker locking tab and slide the internal speaker upward until the speaker is released.



6. Remove the speaker and speaker cable from the computer.
7. Route the new speaker cable and then position the new internal speaker tabs 3 into the metal speaker slots and then push the internal speaker downward until the speaker locking tabs snap into position.
8. Connect the speaker cable to the system board. See “Locating parts on the system board ” on page 81.
9. Go to “Completing the FRU replacement” on page 108.

Completing the FRU replacement

After replacing FRUs, you need to install any removed parts, replace the cover, and reconnect any cables, including telephone lines and power cords. Also, depending on the FRU that is replaced, you might need to confirm the updated information in the Setup Utility program.

Note: When the power cord is first plugged in, the computer might appear to turn on for a few seconds and then turn off. This is a normal sequence to enable the computer to initialize.

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your computer.
2. Replace the cover.
3. Reconnect the external cables and power cords to the computer. See “Rear connectors” on page 109.
4. If you have replaced the system board, you must update (flash) the BIOS. See “Flash update procedures” on page 251.
5. Some FRU replacements require the configuration to be updated. See Chapter 6 “Using the Setup Utility” on page 41.

Chapter 11. Replacing FRUs (Type 4155, 4158, 4218)

Important

Before you replace any FRU, read Chapter 2 "Safety information" on page 3. These precautions and guidelines will help you work safely.

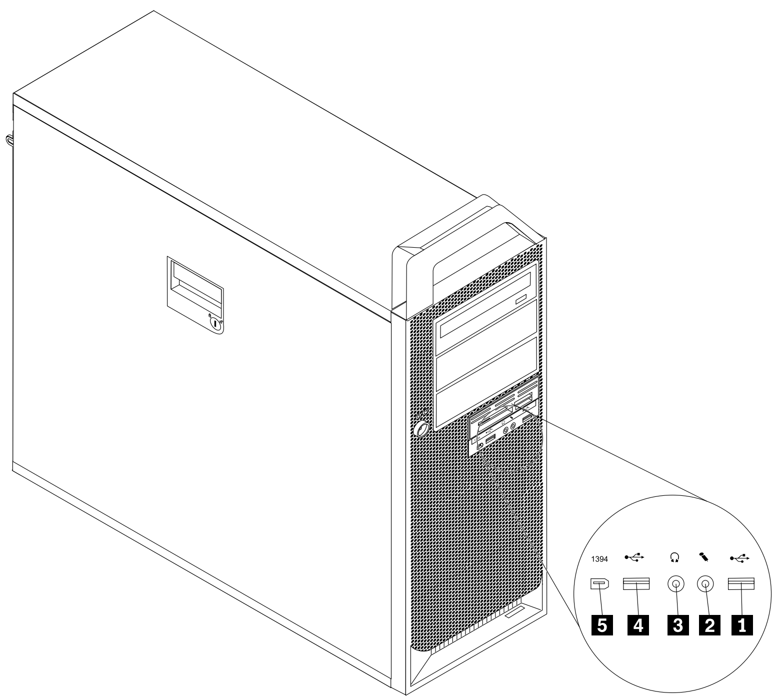
FRU replacements are to be done by trained service technicians only.

This chapter does not contain a remove and replace procedure for all FRUs. Only the major FRUs are documented.

Locating controls and connectors on the front of your computer

The following illustration shows the location of the controls and connectors on the front of your computer.

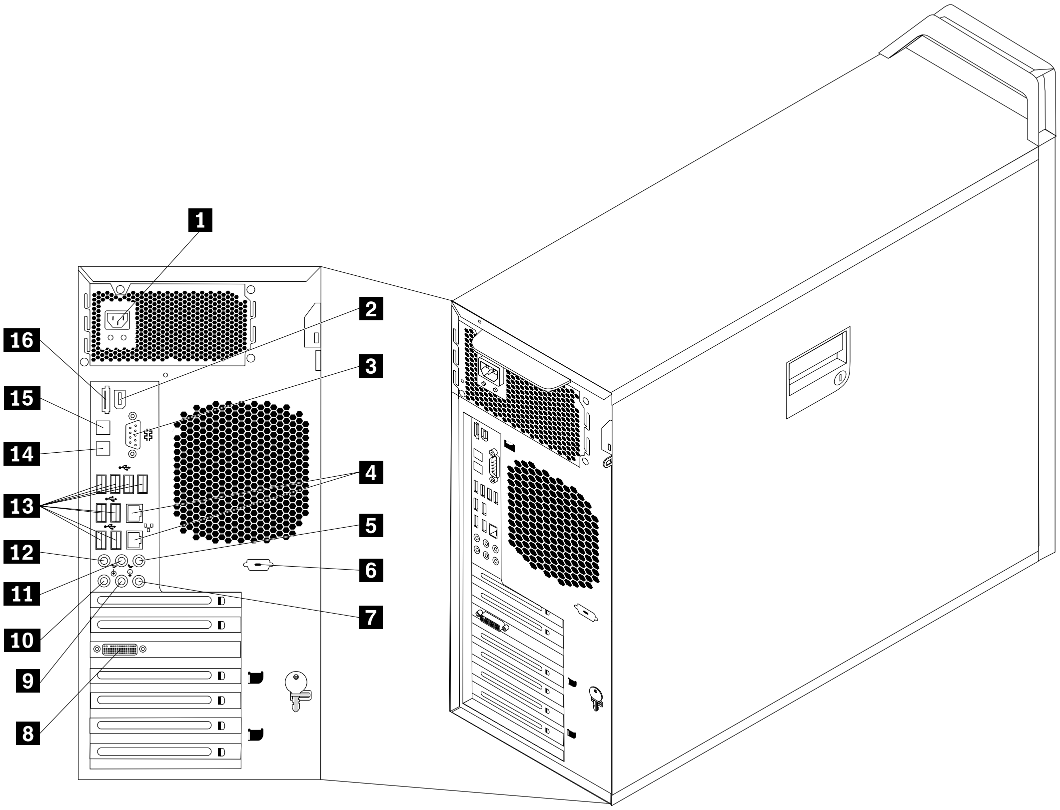
Note: Not all computer models will have the following controls and connections.



1	USB connector	4	USB connector
2	Microphone connector	5	IEEE 1394 connector
3	Headphone connector		

Rear connectors

The following illustration shows the locations of the connectors on the rear of the computer.



- **1** Power cord connector
- **2** IEEE 1394 connector
- **3** Serial port
- **4** Ethernet connectors (2)
- **5** Audio line-out subwoofer/center speakers connector
- **6** Serial port (some models)
- **7** Audio line-in connector
- **8** Video connector (some models)
- **9** Audio line-out front speakers connector
- **10** Microphone connector
- **11** Audio line-out rear speakers connector
- **12** Audio line-out side speaker connector
- **13** USB connectors (8)
- **14** Optical SPDIF (Sony Philips Digital Interconnect Format) out connector
- **15** Optical SPDIF in connector
- **16** eSATA connector

Removing the cover

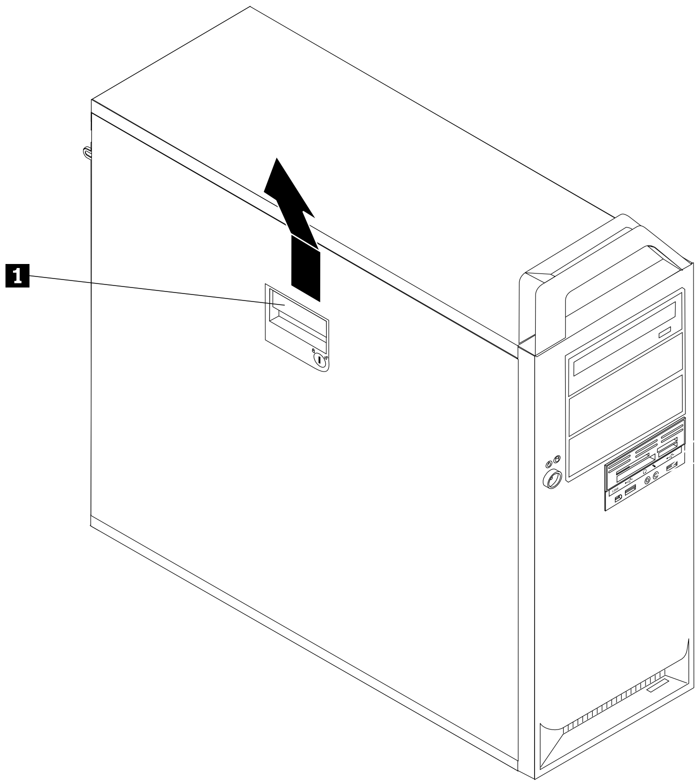
CAUTION:

**The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.**

To remove the computer cover:

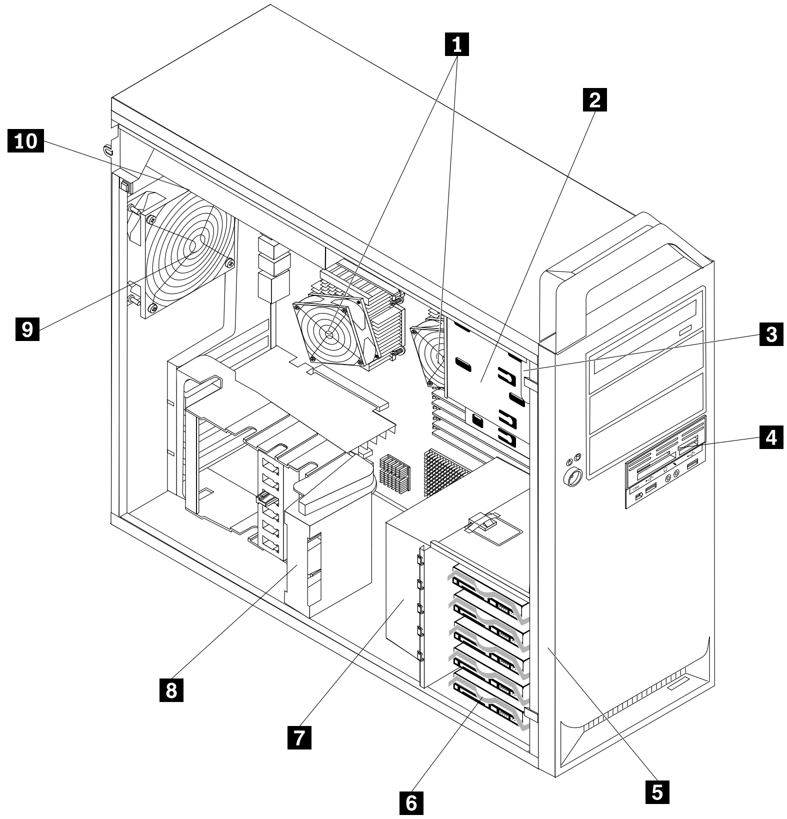
1. Remove any media from the drives and shut down your operating system. Turn off all attached devices. Turn off the computer.
2. Unplug all power cords from electrical outlets.

3. Disconnect the cables attached to the computer. This includes power cords, input/output (I/O) cables, and any other cables that are connected to the computer. See "Locating controls and connectors on the front of your computer" on page 77 and "Rear connectors" on page 109.
4. Remove any locking devices, such as a cable lock or padlock that secures the computer cover. Open the keylock if it is in the locked position.
5. Disengage the cover latch **1** and remove the cover. Place the cover on a flat surface.



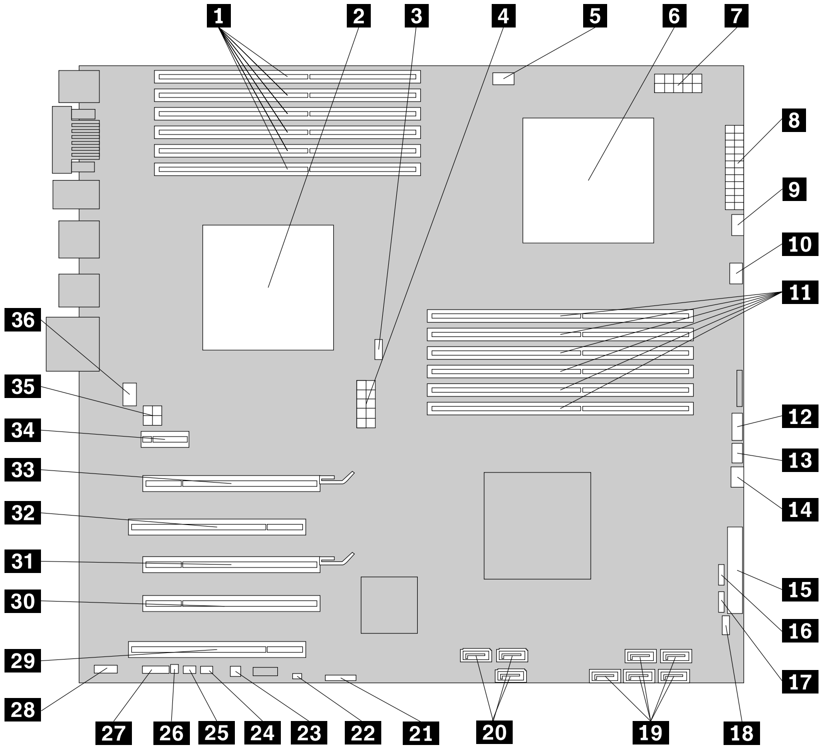
Locations

The following illustration will help you locate the major FRUs in the computer.



1	Microprocessors and heat sinks (2)	6	Hard disk drive bays (5)
2	Optical drive bays (3)	7	Hard disk drive fan assembly
3	Internal speaker	8	Adapter card retainer
4	3.5-inch diskette drive or card reader	9	Rear fan assembly
5	Front bezel	10	Power supply assembly

Locating parts on the system board

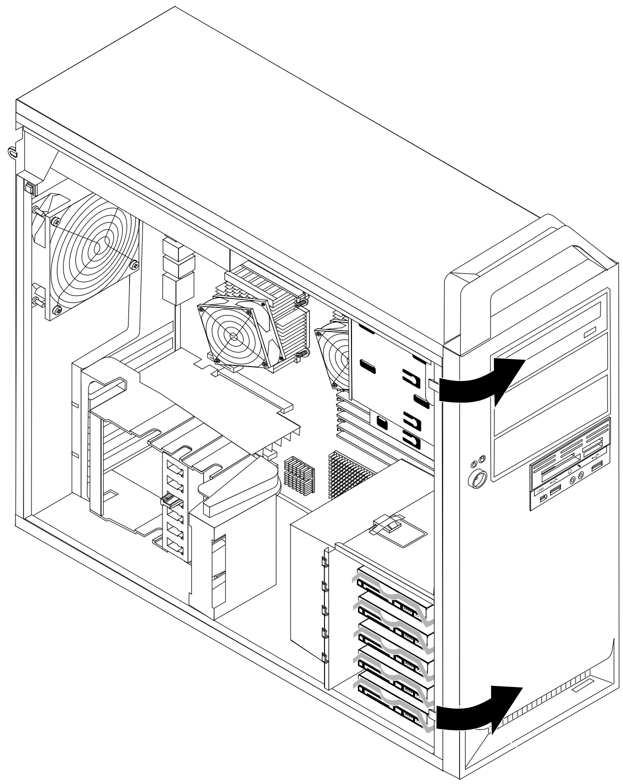


1	CPU 1 memory slots (6)	19	Hard disk drive connectors (5)
2	Microprocessor and heat sink 1	20	Optical drive connectors (3)
3	CPU 1 fan connector	21	Battery
4	CPU 1 12 V power connector	22	Clear CMOS/Recovery jumper
5	CPU 1 memory fan connector	23	Thermal sensor connector
6	Microprocessor and heat sink 2	24	Cover presence switch connector
7	CPU 2 12 V power connector	25	PS/2 keyboard and mouse connector
8	24-pin power connector	26	Internal speaker connector
9	CPU 2 fan connector	27	COM 2 connector
10	CPU 2 memory fan connector	28	Front audio connector
11	CPU 2 memory slots (6)	29	PCI adapter card slot
12	Power switch/LEDs connector	30	PCI Express x4 graphics adapter card slot (x16 mechanical)
13	Auxiliary LED connector	31	PCI Express x16 graphics adapter card slot
14	Hard disk drive fan connector	32	PCI adapter card slot
15	Diskette drive connector	33	PCI Express x16 graphics adapter card slot
16	Card reader connector	34	PCI Express x1 adapter card slot
17	Front USB connector	35	Graphic card power connector
18	Front IEEE 1394 connector	36	Rear fan connector

Removing the front bezel

To remove the front bezel:

1. Remove the cover. See "Removing the cover" on page 78.
2. Remove the front bezel by releasing the three plastic tabs **1** on the left side and pivoting the bezel outward.



3. Lay the front bezel on a flat surface.
4. To reinstall the bezel, align the plastic tabs on the right side of the bezel with the corresponding holes in the chassis, then pivot the bezel inward until it snaps into position on the left side.

Replacing the power supply

Attention

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no servicable parts inside these components.

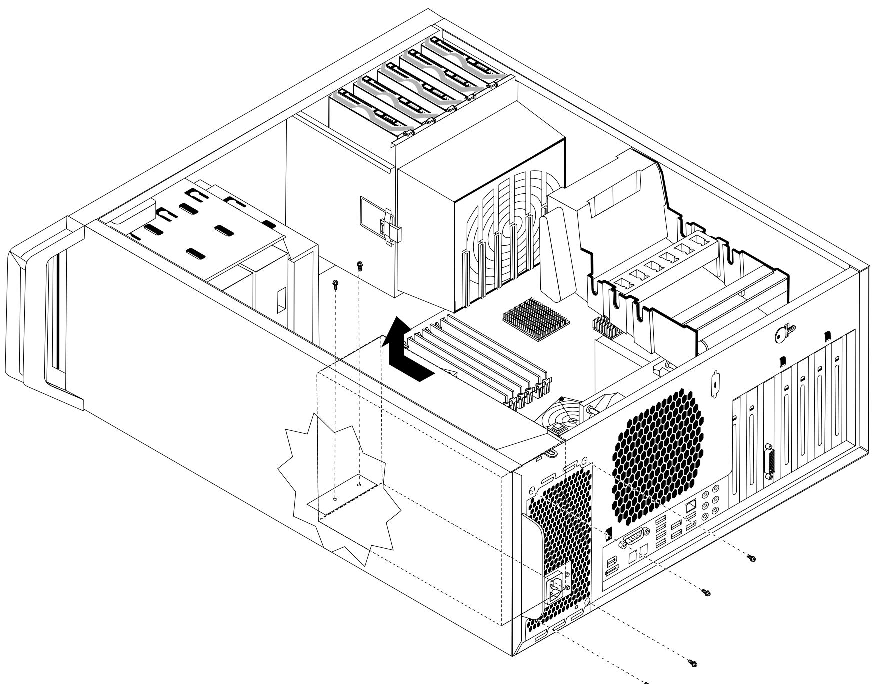
Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

This section provides information about how to move and replace the power supply.

To replace the power supply, do the following:

1. Remove the computer cover and then lay the computer on its side. See "Removing the cover" on page 78.
2. Locate the power supply. See "Locations" on page 79.
3. Disconnect the power supply cables from the system board connectors. Disconnect the power supply cables from all adapter cards (some models) and from all drives.
4. Remove the power supply cables from the cable clips and ties.
5. Remove the six power supply retaining screws at the rear of the chassis and inside the chassis.



6. Slide the power supply assembly toward the front of the computer and lift it out from the chassis.
7. Ensure that the new power supply is the correct replacement. Some power supplies automatically sense the voltage, some power supplies are voltage specific, and some power supplies have a voltage-selection switch. If there is a voltage-selection switch, use a ballpoint pen to slide the switch, if necessary.

   Note: For models that have a voltage-selection switch:

   - If the voltage supply range is 100–127 V AC, set the switch to 115 V.
   - If the voltage supply range is 200–240 V AC, set the switch to 230 V.
8. Install the new power supply into the chassis so that the screw holes in the power supply align with those in the chassis.

Note: Use only the screws provided by Lenovo.

9. Install and tighten the four screws at the rear of the chassis to secure the power supply.
10. Install and tighten the two screws that secure the power supply to the inside of the chassis.
11. Reconnect all power supply cables to the drives, adapter cards, and the system board. Make sure to reconnect the power cable to the graphics cards that require an additional cable.
12. Go to "Completing the FRU replacement" on page 108.

Installing or replacing a memory module

Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

CAUTION:

The memory module might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

Your computer has 12 slots for installing or replacing DDR3 ECC UDIMMs (double data rate 3 error correction code unbuffered dual in-line memory modules) or DDR3 ECC RDIMMs (double data rate 3 error correction code registered dual inline memory modules).

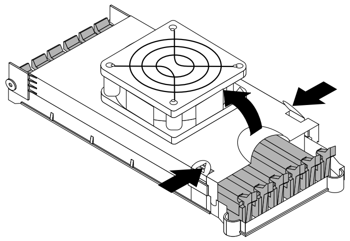
When installing or replacing memory modules, use the following guidelines:

- Use either DDR3 ECC UDIMMs or DDR3 ECC RDIMMs for your computer. Do not install both the UDIMMs and RDIMMs into the same computer.
- If your computer has only one CPU installed, be sure to install memory modules only in the memory slots adjacent to that CPU.
- If your computer has two CPUs installed, install equal numbers of memory modules in both sets of CPU DIMM slots for maximum performance. And the total amount of memory should be evenly balanced between the 2 banks. For example: If you are to install six 1 GB DIMMs in a dual-processor system, three of the 1 GB DIMMs should be installed in the CPU1 slots, and the other three should be installed in the CPU2 slots.
- Memory must always be installed in the blue sockets first, starting with the blue socket closest to each respective CPU. Install in the black sockets only after all blue sockets are occupied.

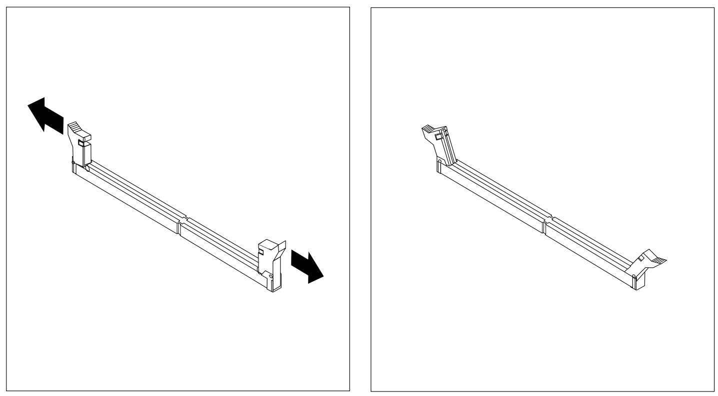
To install or replace a memory module:

1. Remove the computer cover. See "Removing the cover" on page 78.
2. Lay the computer on its side.
3. Locate the memory slots. See "Locating parts on the system board " on page 113.

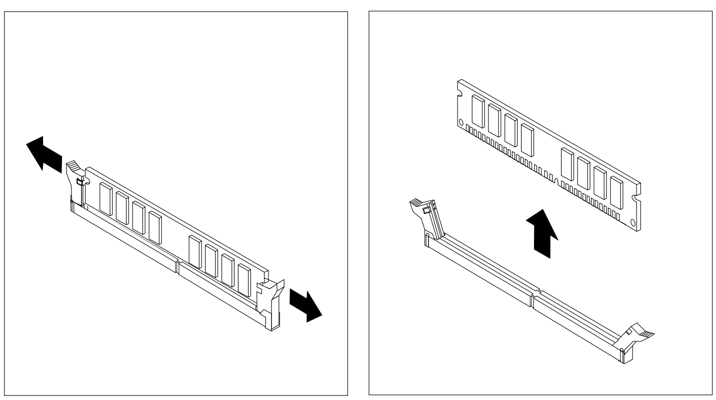
   Note: If it is the first time that the memory module being replaced, you might have to remove the blue shipping clip before removing the memory fan duct. If the computer is to be repackaged and shipped, the shipping clip must be reinstalled.
4. For some computer models, you might need to remove the memory fan duct to access the memory slots. To remove the memory fan duct, remove the blue shipping clip, disconnect the memory fan cable from the system board, press inward on the two tabs, pivot the fan duct, and then disengage the other end of the duct.



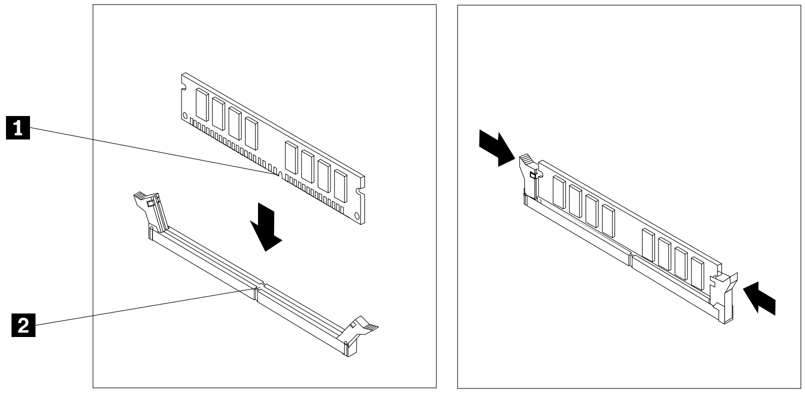
5. Open the retaining clips as shown.



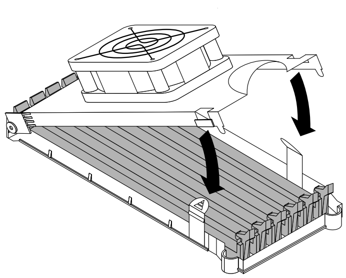
If you are replacing an old memory module, open the retaining clips and remove the memory module being replaced as shown.



6. Position the new memory module over the memory slot. Make sure the notch **1** on the memory module aligns correctly with the slot key **2** on the system board. Push the memory module straight down into the slot until the retaining clips close.



7. To install the memory fan, engage the rear of the duct with the retainer on the system board and then pivot the duct downwards until the duct snaps into position. Reconnect the memory fan cable to the system board.



8. Go to “Completing the FRU replacement” on page 108.

Note: Your system memory speed is determined by a number of factors, including the microprocessor model and the type, speed, size (capacity), and number of DIMMs installed.

Replacing a PCI adapter card

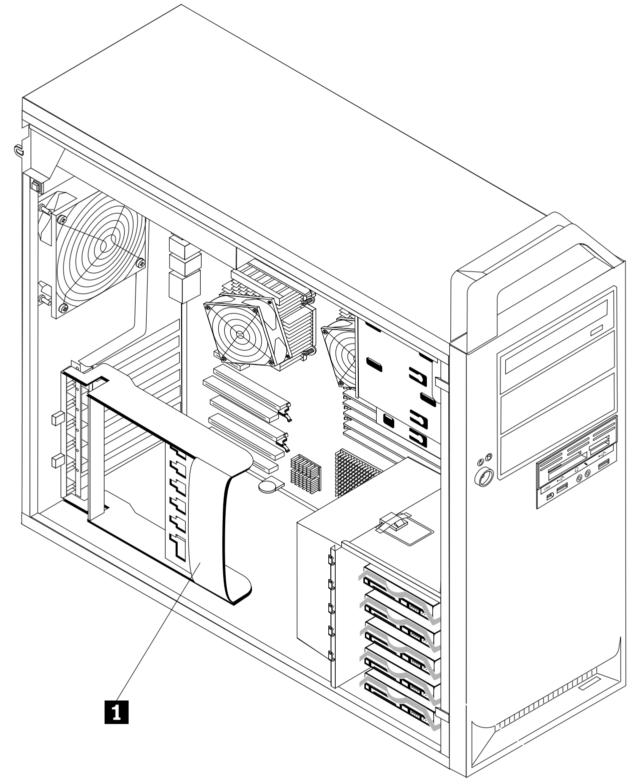
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

This section provides information about how to replace a PCI adapter card.

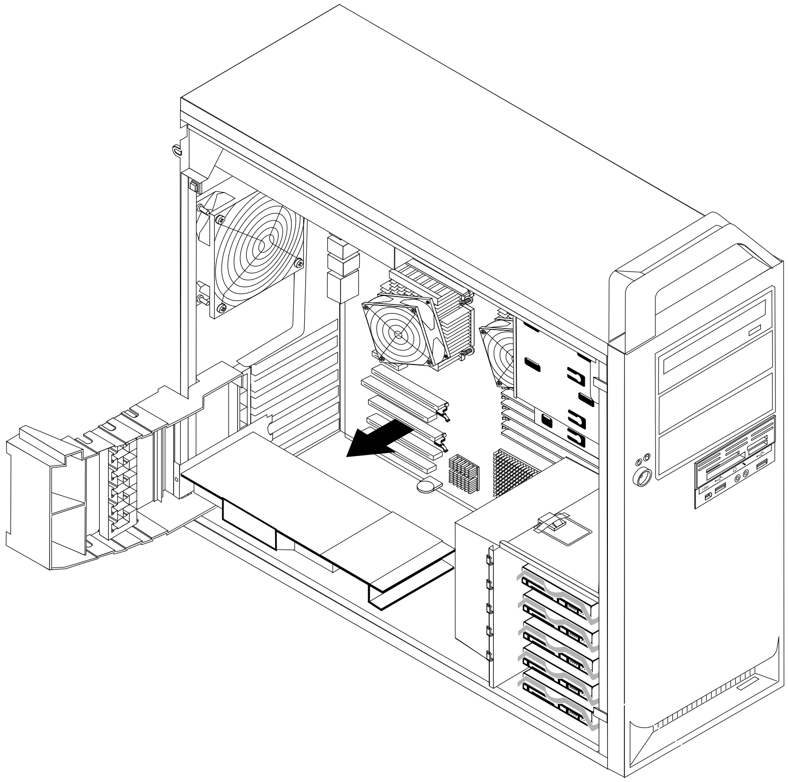
To replace a PCI adapter card, do the following:

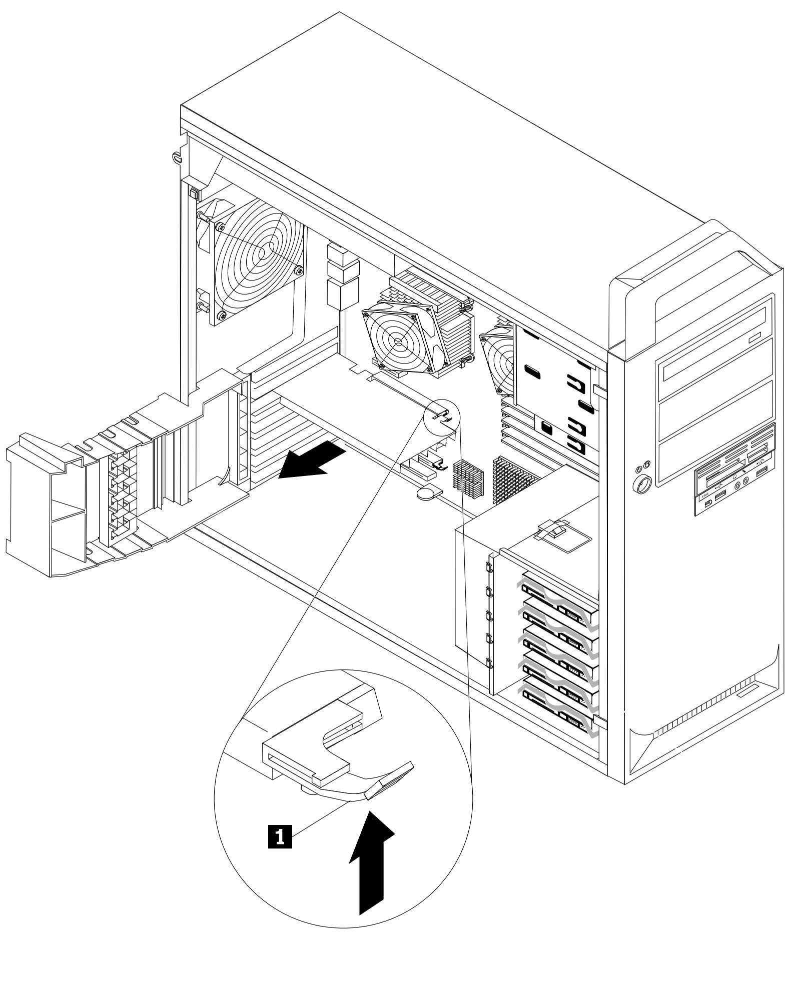
1. Remove the computer cover. See “Removing the cover” on page 78.
2. Unlatch and open the card retainer .



3. Take note of the location of all cable connections on the adapter card. It will be necessary to reconnect them properly when installing a new card.
4. Disconnect all cables connected to the adapter card. See "Locating parts on the system board " on page 113.
5. Some models have:
   - A screw installed in the adapter bracket, remove this screw.
   - An additional retention feature located on the card guide end. Push the retention feature toward the front of the chassis before removing the adapter card.
6. Release the card support retaining latches. Grasp the adapter card and pull the card out of the slot.

   Note: The card is a tight fit, so it might be necessary to remove each side a little at a time until the card is removed from the card slot.




1

7. Reverse this procedure to install the card.
8. Go to “Completing the FRU replacement” on page 108.

Replacing the heat sink

CAUTION:

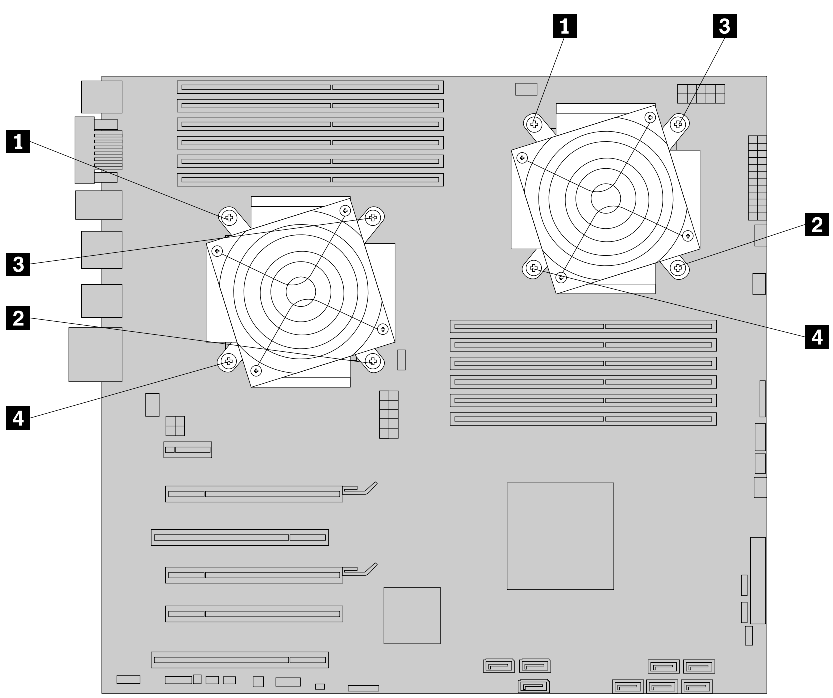
The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

> **Attention**
>
> Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
> http://www.lenovo.com/support.

This section provides instructions on how to replace and install the heat sink.

To replace the heat sink:

1. Open the computer cover. See “Removing the cover” on page 78.
2. Lay the computer on its side for easier access to the heat sink.
3. Remove the heat sink and fan assembly cables from the system board. Note the cable location. See “Locating parts on the system board ” on page 113.
4. Follow this sequence to remove the heat sink from the system board:
   a. Partially remove screw **1**, then fully remove screw **2**, and fully remove screw **1**.
   b. Partially remove screw **3**, then fully remove screw **4**, and fully remove screw **3**.



5. Carefully lift the heat sink off of the system board.
6. Remove the plastic cover from the bottom of the new heat sink to expose the heat sink grease (this cover protects the heat sink grease from contamination).

Notes:

a. Do not remove the plastic cover until you are ready to install the heat sink and fan assembly on the microprocessor. Do not touch the grease on the heat sink and fan assembly. Do not put the heat sink and fan assembly anywhere except on the microprocessor after the plastic cover has been removed and the grease exposed.

b. Some heat sink part numbers will have orientation labels showing "Front of System." Heat Sinks that do not have orientation labels should be oriented so the fan cable is toward the board connector labeled "CPU Fan."

7. Place the new heat sink into position.

   Important: Do not touch the thermal grease while handling the heat sink.

8. Align the four screws on the heat sink with the four mounting studs in the chassis.

9. Follow this sequence to install the screws, noting that fully tight is 5 in-lbs +/- 0.5 in-lbs:

   a. Partially tighten screw **1**, then fully tighten screw **2**, and fully tighten screw **1**.

   b. Partially tighten screw **3**, then fully tighten screw **4**, and fully tighten screw **3**.

10. Reconnect the heat sink fan cable. See “Locating parts on the system board ” on page 113.

11. Go to “Completing the FRU replacement” on page 108.

Replacing the microprocessor

CAUTION:



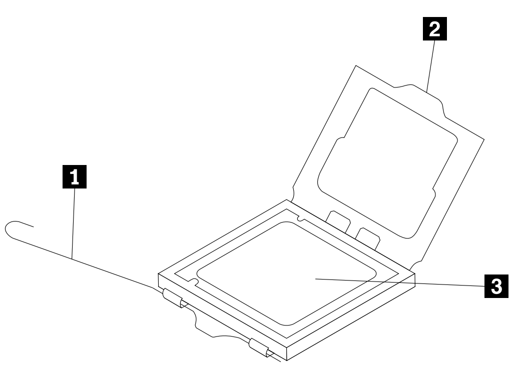
The heat sink and microprocessor might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

> **Attention**
>
> Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
> http://www.lenovo.com/support.

This section provides instructions on how to replace the microprocessor.

To replace the microprocessor:

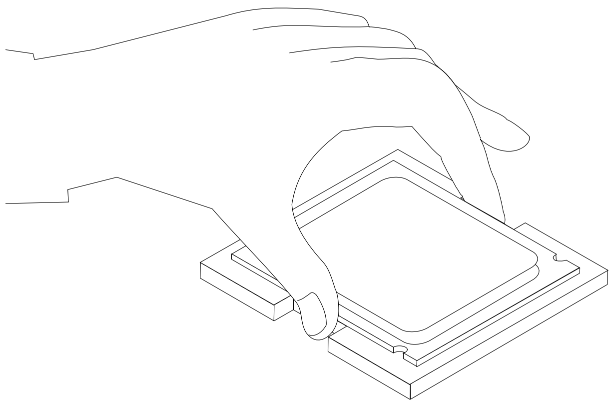
1. Open the computer cover. See “Removing the cover” on page 78.
2. Place the computer on its side to help make the system board more accessible.
3. Remove the heat sink from the system board. See “Replacing the heat sink” on page 90.
4. To remove the microprocessor **3** from the system board, lift the small handle **1** and open the retainer **2**.



Important

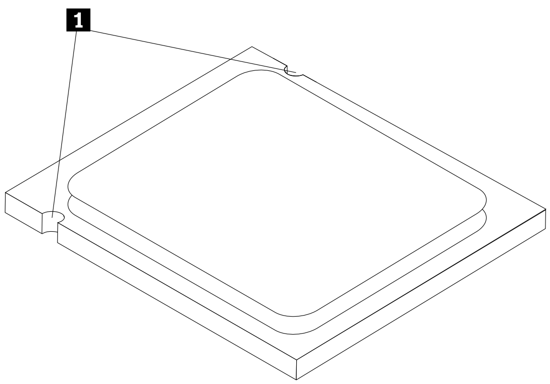
Touch only the sides of the microprocessor. Do not touch the gold contacts on the bottom.

5. Lift the microprocessor straight up and out of the socket.



Notes:

a. Note the orientation of the notches **1** on the microprocessor. This is important when reinstalling the microprocessor on the new system board.



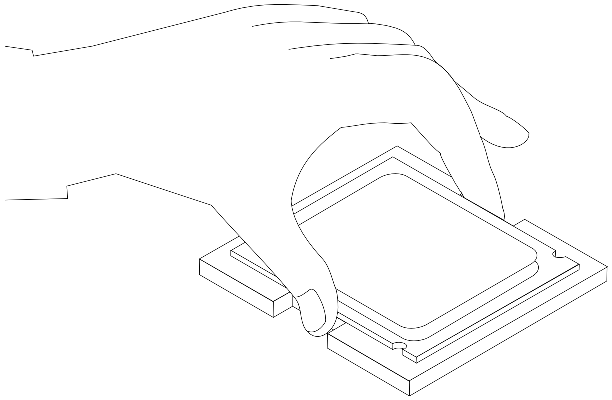
b. Do not drop anything onto the microprocessor socket while it is exposed. The socket pins must be kept as clean as possible.

6. Holding the microprocessor with your fingers, position the microprocessor so that the notches on the microprocessor are aligned with the tabs in the microprocessor socket.

Important

To avoid damaging the microprocessor contacts, do not tilt the microprocessor when installing it into the socket.

7. Lower the microprocessor straight down into the microprocessor socket of the system board.



8. Close the microprocessor retainer and clamp it with the small handle.
9. Place the heat sink into position and replace the 4 screws to secure the heat sink to the system board.
10. Reconnect the heat sink fan cable.
11. Go to “Completing the FRU replacement” on page 108.

Replacing the system board

CAUTION:



The heat sink, microprocessor, and memory module might be very hot. Turn off the computer and wait three to five minutes to let the computer cool before opening the computer cover.

Attention

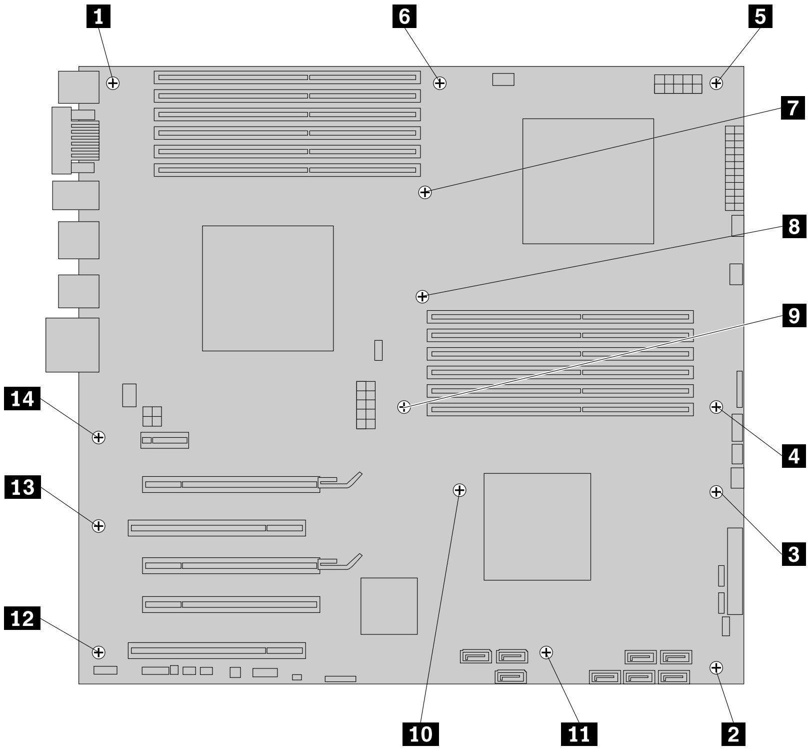
Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

Note: When replacing the system board a new retention module for the microprocessor heat sink is required. Make sure you have a new retention module before beginning this procedure.

This section provides instructions on how to remove and install the system board.

To replace the system board:

1. Open the cover. See “Removing the cover” on page 78.
2. Lay the computer on its side for easier access to the system board.
3. Remove the hard disk drive fan. See “Replacing the hard disk drive fan assembly” on page 100.
4. Remove any adapter cards installed in the PCI connectors. See “Replacing a PCI adapter card” on page 86.
5. Remove the memory modules from the failing system board.
6. Remove the heat sink from the failing system board. See “Replacing the heat sink” on page 90.
7. Note the location of all cable connections on the system board and disconnect all cables. See “Locating parts on the system board ” on page 113.
8. Remove the nine screws that secure the system board to the chassis, following the sequence shown in the figure:



9. Carefully lift the system board out of the chassis.
10. Remove the microprocessor socket cover from the new system board.
11. Remove the microprocessor from the failing system board and install it on the new system board. See "Replacing the microprocessor" on page 92.
12. The failing system board must be returned with a microprocessor socket cover to protect the pins during shipping and handling. Install the microprocessor socket cover removed from the new system board on the failing system board.

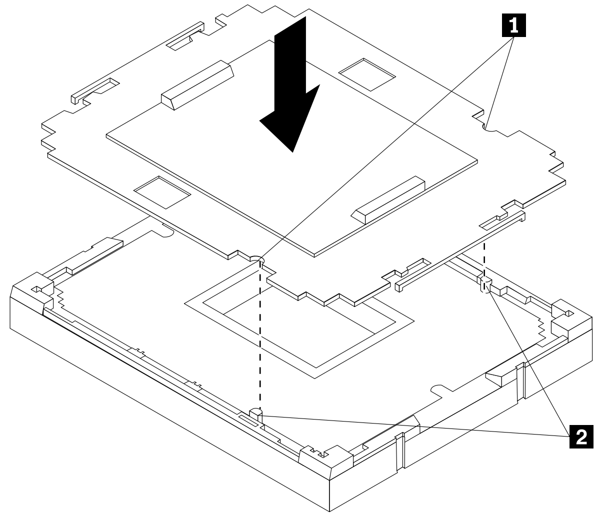
    Note: The microprocessor socket cover installation procedure should be performed on both processors.

    To install the microprocessor socket cover:

    a. Release the lever securing the microprocessor retainer and open the retainer to access the microprocessor.

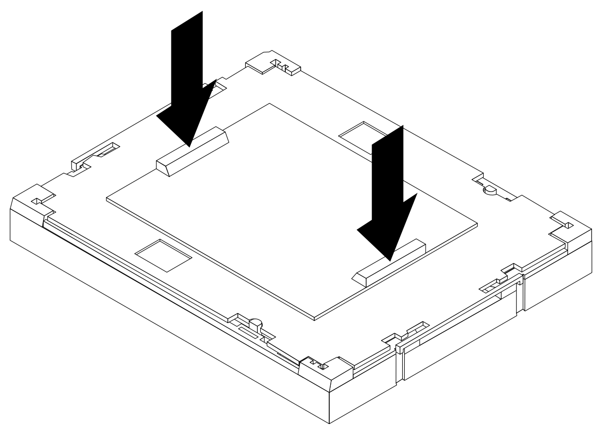
    b. Grasp the microprocessor on the sides and lift it straight up and out of the socket. Do not touch the contacts on the microprocessor socket.

    c. Align the notches **1** of the microprocessor socket cover with the alignment keys **2** of the microprocessor socket. Lower the socket cover straight down into the microprocessor socket on the system board.



Note: Your microprocessor socket and cover might look slightly different from the illustration.

d. Carefully press the socket cover straight downwards until it is secured into the socket.



e. Lower the microprocessor retainer and then lower the lever to secure the retainer. Make sure the lever is securely locked into position.

f. Follow any additional instructions included with the replacement part you received.

13. Install the new system board into the chassis and align the screw holes with those in the chassis. Insert and tighten the screws that secure the system board following the sequence shown in the figure above.
14. Install the memory modules in the same location on the new system board.
15. Install the microprocessor on the new system board. See "Replacing the microprocessor" on page 92
16. Install the heat sink and fan assembly on the new system board. See "Replacing the heat sink" on page 90.
17. Connect the heat sink and fan assembly cable to the new system board. See "Locating parts on the system board " on page 113.
18. Install the hard disk drive fan. See "Replacing the hard disk drive fan assembly" on page 100.
19. Connect all cables to the system board. See the system board illustration for your machine type at "Locating parts on the system board " on page 113.
20. Go to "Completing the FRU replacement" on page 108.

Replacing a hard disk drive

Attention

Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

This section provides instructions on how to replace the hard disk drive.

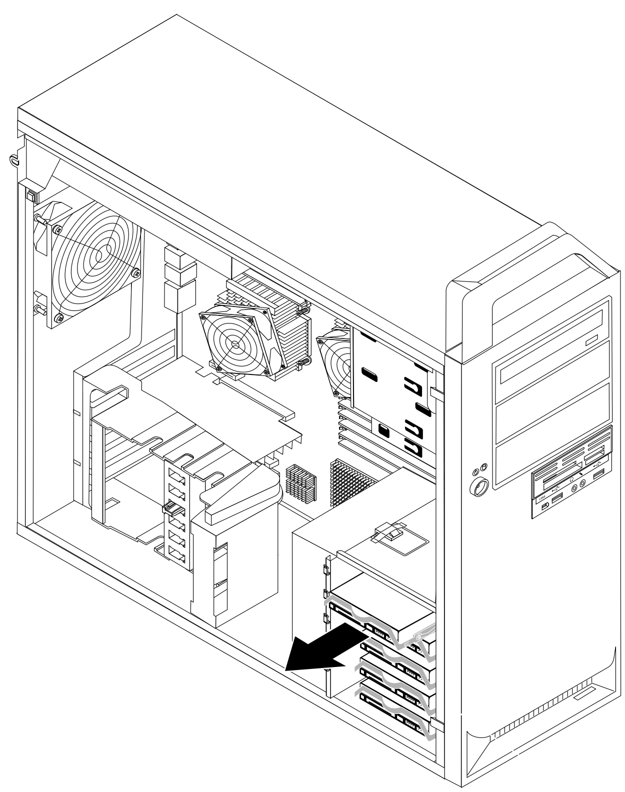
Important

When you receive a new hard disk drive, you also receive a set of *Product Recovery discs*. The set of *Product Recovery discs* will enable you to restore the contents of the hard disk drive to the factory-installed state. For more information on recovering factory-installed software, refer to "Recovering software" in your *ThinkStation User Guide*.

Attention: Your computer supports both SAS hard disk drives and SATA hard disk drives. However, be sure that you do not install both the SAS and SATA hard disk drives into the same computer.

To replace a hard disk drive:

1. Remove the computer cover. See "Removing the cover" on page 78.
2. Locate the hard disk drive. See "Locations" on page 79.
3. Disconnect the signal and power cables from the hard disk drive.
4. Pull the handle to remove the hard disk drive.



5. Remove the failing hard disk drive from the bracket by flexing the bracket.

6. To install the new hard disk drive into the bracket, flex the bracket, and then align pin **1**, pin **2**, pin **3**, and pin **4** on the bracket with the holes in the hard disk drive. Do not touch the circuit board **5** on the bottom of the hard disk drive.

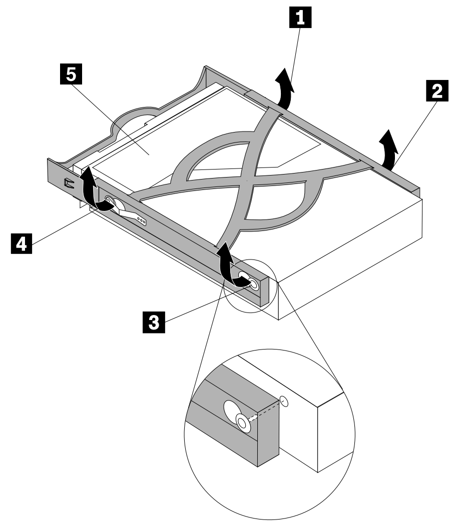


Figure 6. Installing a 3.5-inch hard disk drive into the bracket

Note: If you are installing a 2.5-inch hard disk drive into the bracket, flex the bracket, and then align pin **1**, pin **2**, pin **3**, and pin **4** on the bracket with the holes in the hard disk drive adapter **5**.

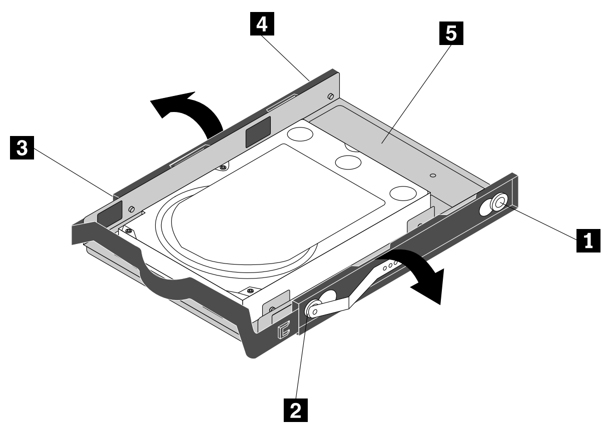


Figure 7. Installing a 2.5-inch hard disk drive into the bracket

7. Install the hard disk drive and bracket into the drive bay.
8. Using the signal cable that came with the new drive, connect one end of the signal cable to the drive. Locate one of the extra five-wire power cables and connect it to the drive.

   Note: The signal cable will be different depending on whether you are installing a SATA hard disk drive or a SAS hard disk drive.

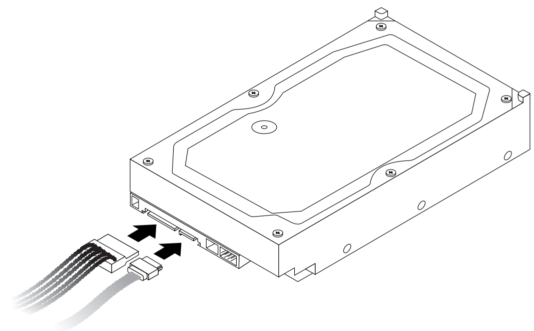


Figure 8. Connecting a 3.5-inch SATA hard disk drive

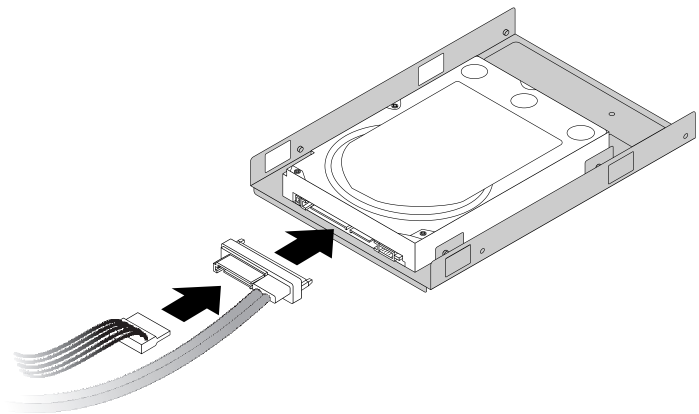


Figure 9. Connecting a 2.5-inch SATA hard disk drive

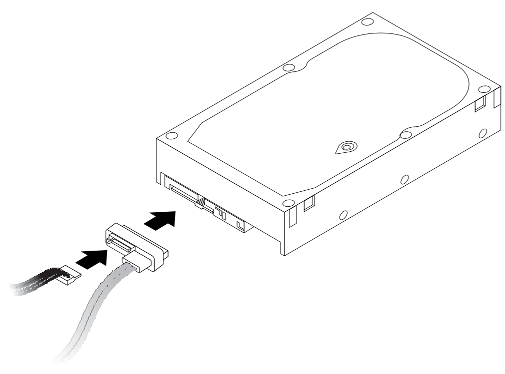


Figure 10. Connecting a 3.5-inch SAS hard disk drive

9. Go to “Completing the FRU replacement” on page 108.

Replacing the hard disk drive fan assembly

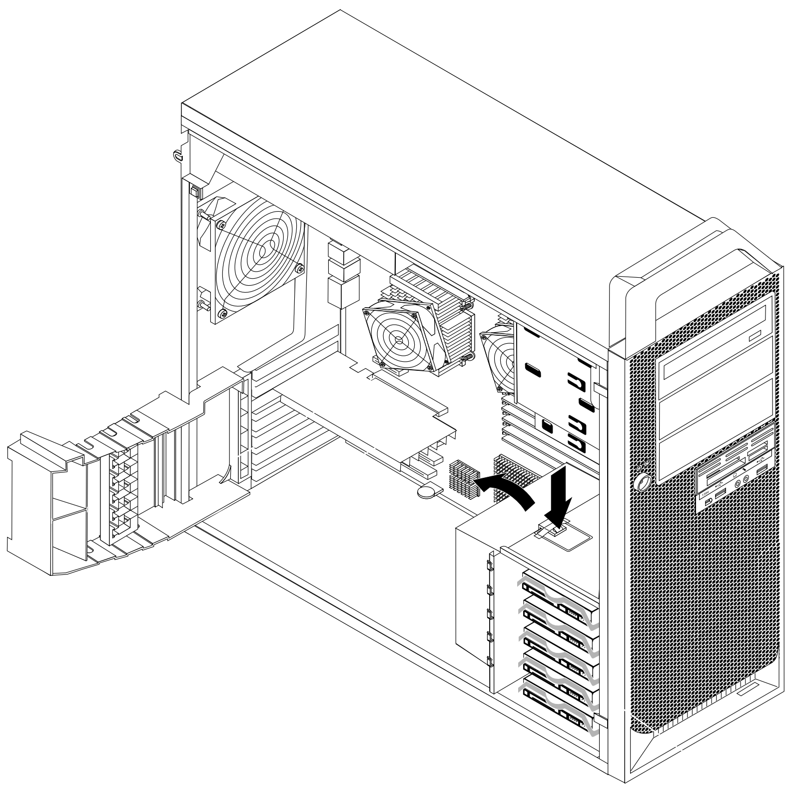
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

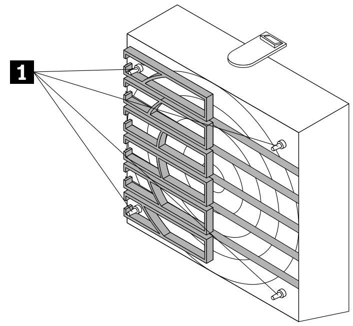
This section provides instructions on how to replace the hard disk drive fan assembly.

To replace the hard disk drive fan assembly:

1. Remove the computer cover. See “Removing the cover” on page 78.
2. Locate the hard disk drive fan assembly. See “Locations” on page 79.
3. Unlatch and open the adapter card retainer.
4. Press the hard disk drive fan assembly bracket latch downwards and pivot the bracket to remove it from the chassis.



5. Disconnect the hard disk drive fan assembly cable from the system board.
6. The hard disk drive fan assembly is attached to the bracket by four rubber mounts **1**. Remove the fan assembly by gently pulling it out of the bracket.



7. Install the new hard disk drive fan assembly by aligning the rubber mounts of the fan assembly with the holes in the hard disk drive fan assembly bracket and pushing the rubber mounts through the holes.
8. Connect the hard disk drive fan assembly cable to the system board, and then install the bracket and hard disk drive fan assembly to the chassis.
9. Go to "Completing the FRU replacement" on page 108.

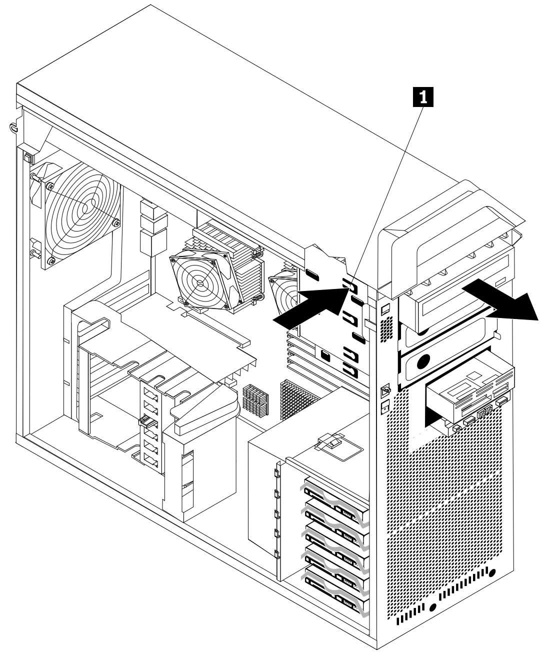
Replacing an optical drive

Attention

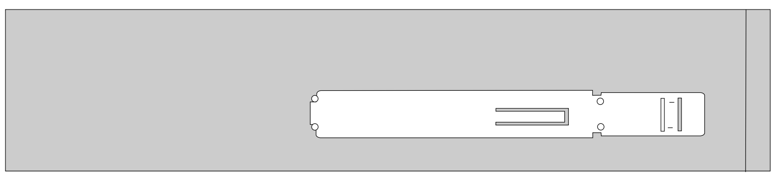
Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

This section provides instructions on how to replace an optical drive.

1. Remove the computer cover. See "Removing the cover" on page 78.
2. Remove the front bezel. See "Removing the front bezel" on page 82.
3. Locate the optical drive. See "Locations" on page 79.
4. Note the location of the optical drive cables. Disconnect the signal and power cables from the rear of the optical drive.
5. Press the drive latch **1** (for the drive you want to remove) and slide the optical drive from the chassis.



6. Remove the retainer bracket from the drive being replaced and install it on the new drive.



7. Slide the new optical drive into the bay from the front until it snaps into position.
8. Reconnect the signal and power cables to the new drive.
9. Go to “Completing the FRU replacement” on page 108.

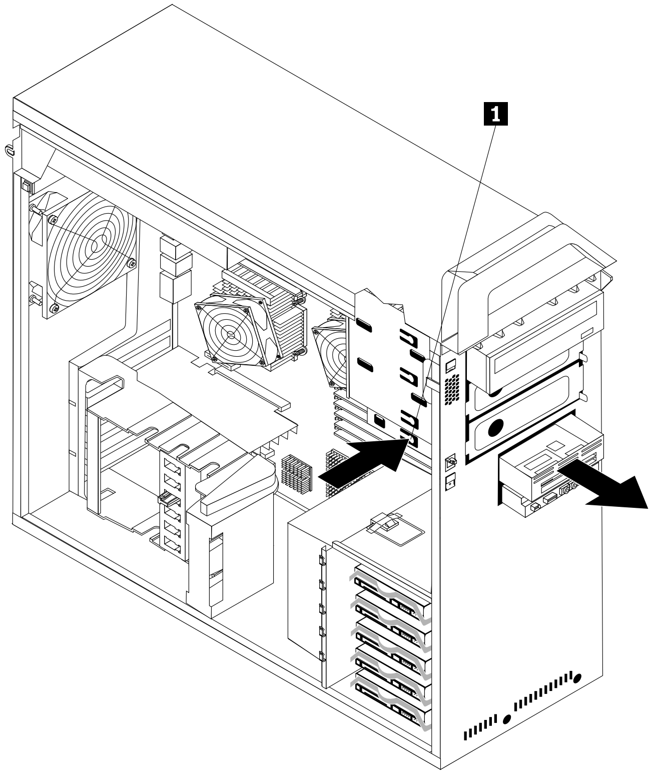
Replacing the diskette drive or card reader

Attention

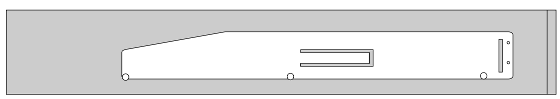
Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

This section provides instructions on how to replace the diskette drive or card reader.

1. Remove the computer cover. See “Removing the cover” on page 78.
2. Remove the front bezel. See “Removing the front bezel” on page 82.
3. Locate the diskette drive or card reader. See “Locations” on page 79.
4. Access system board components.
5. Note the routing of the signal cable. Disconnect the signal cable from the system board.
6. Press the drive latch **1** and slide the diskette drive or card reader out the front of the chassis.



7. Install the retainer bracket on the new diskette drive or card reader.



8. Disconnect the signal cable from the failing diskette drive or card reader and connect it to the new drive.
9. Slide the new diskette drive or card reader into the drive bay until it snaps into position.
10. Connect the diskette drive cable to the diskette drive connector on the system board. If you are installing a card reader, connect it to the card reader connector on the system board. See “Locating parts on the system board ” on page 113.
11. Reinstall the hard disk drive fan bracket if removed.
12. Reinstall the front bezel.
13. Go to “Completing the FRU replacement” on page 108.

Replacing the front and rear fan assemblies

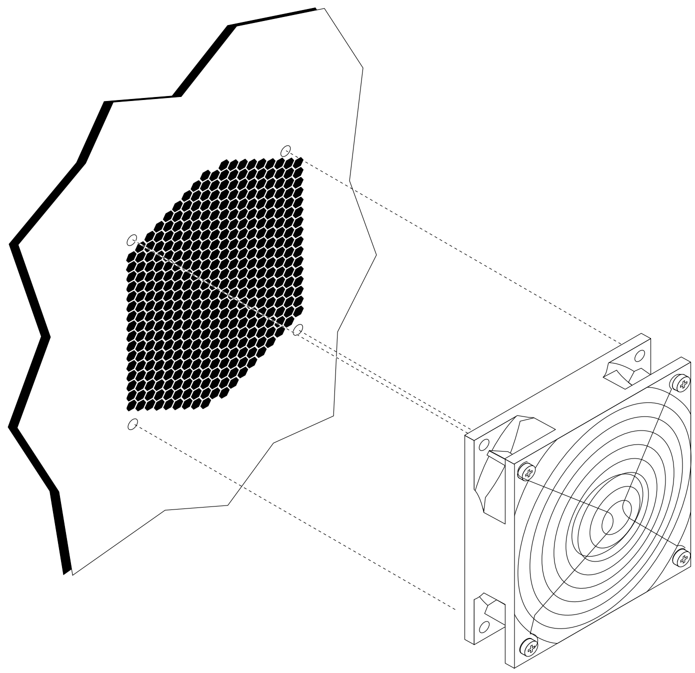
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

This section provides instructions on how to replace the front and rear fan assemblies.

1. Remove the computer cover. See “Removing the cover” on page 78.
2. Locate the fan assembly that you want to replace. Your computer has one front fan assembly and one rear fan assembly. See “Locations” on page 79.

3. Disconnect the fan assembly cable from the system board. See “Locating parts on the system board ” on page 113.
4. The fan assembly is attached to the chassis by four rubber mounts. Carefully remove the four rubber mounts by breaking them or cutting them with scissors and then remove the fan assembly out of the chassis.



5. Install the new fan assembly by aligning the four rubber mounts of the fan assembly with the holes on the chassis and push the rubber mounts through the holes.
6. Pull on the tips of the rubber mounts until the fan assembly is in place.
7. Depending on which fan assembly you are replacing, reconnect the fan assembly cable to the adapter card fan assembly connector or the rear fan assembly connector on the system board. See “Locating parts on the system board ” on page 113.
8. Go to “Completing the FRU replacement” on page 108.

Replacing the front panel connectors assembly

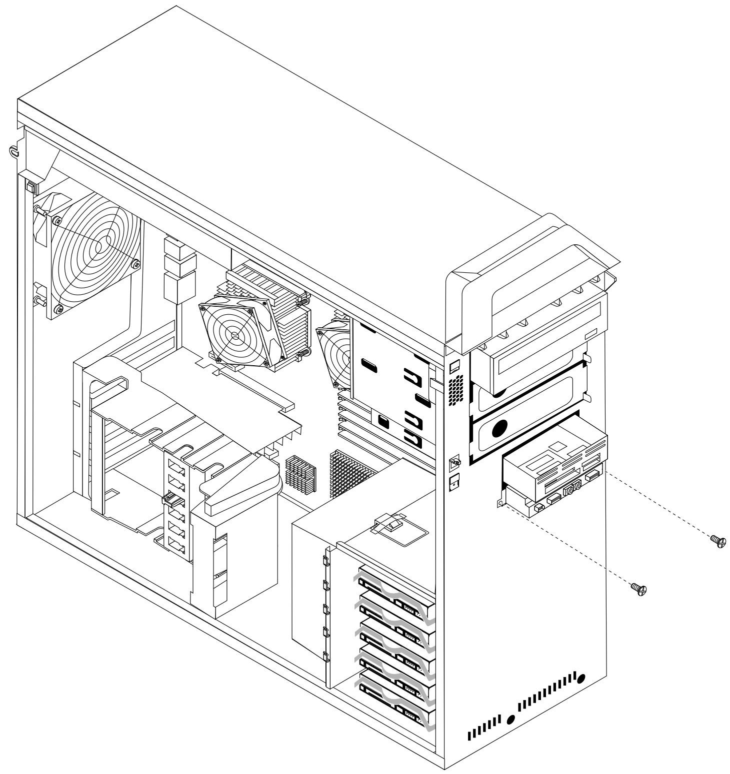
Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

This section provides instructions on how to replace the front panel connectors assembly.

1. Remove the computer cover. See “Removing the cover” on page 78.
2. Remove the front bezel. See “Removing the front bezel” on page 82.
3. Locate the front panel connectors assembly.
4. Access system board components.
5. Disconnect the front audio, front USB, auxiliary LED, and IEEE 1394 cables from the system board and note the cables routing.

6. Remove the two screws that secure the front panel connectors assembly to the chassis and then release the front panel connectors assembly from the chassis.



7. Align the screw holes in the new front panel connectors assembly with the holes in the chassis. Install the two screws to secure the assembly.
8. Reconnect all the cables to the system board. See “Locating parts on the system board ” on page 113.
9. Reinstall the hard disk drive fan bracket if removed.
10. Reinstall the front bezel.
11. Go to “Completing the FRU replacement” on page 108.

Replacing the power switch/LED assembly

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

This procedure describes how to remove and replace the power switch/LED assembly.

1. Remove the computer cover. See “Removing the cover” on page 110.
2. Remove the front bezel. See “Removing the front bezel” on page 114
3. Disconnect the power switch/LED assembly cable from the system board. See “Removing the front bezel” on page 114.
4. Note the power switch/LED assembly cable routing and the position of the two LEDs.
5. Remove the switch and the LEDs from the bezel.

6. Route the cable for the new power switch/LED assembly through the hole in the chassis and to the system board.
7. Install the new power switch/LED assembly into the bezel. Make sure that the LEDs are in the correct position.
8. Connect the power switch/LED cable to the system board.
9. Reinstall the front bezel.
10. Go to "Completing the FRU replacement" on page 138.

Replacing the battery

> **Attention**
>
> Do not open your computer or attempt any repair before reading and understanding the "Important safety information" in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
> http://www.lenovo.com/support.

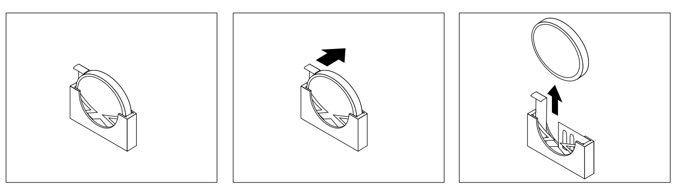
Your computer has a special type of memory that maintains the date, time, and settings for built-in features, such as serial-port assignments (configuration). A battery keeps this information active when you turn off the computer.

The battery normally requires no charging or maintenance throughout its life; however, no battery lasts forever. If the battery fails, the date, time, and configuration information (including passwords) are lost. An error message is displayed when you turn on the computer.

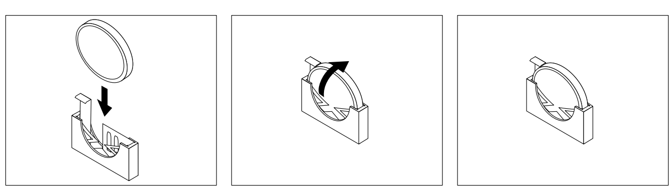
Refer to the "Lithium battery notice" in the *ThinkStation Safety and Warranty Guide* for information about replacing and disposing of the battery.

To replace the battery:

1. Turn off the computer and disconnect the power cord from the electrical outlet and from the computer.
2. Open the computer cover. See "Removing the cover" on page 78.
3. Access the system board.
4. Locate the battery. See "Locating parts on the system board " on page 113.
5. Remove the old battery.



6. Install the new battery.



7. Replace any adapter card that was removed. Replace the computer cover and connect the cables. See "Completing the FRU replacement" on page 108.

Note: When the computer is turned on for the first time after replacing the battery, an error message might be displayed. This is normal after replacing the battery.

8. Turn on the computer and all attached devices.
9. Use the Setup Utility program to set the date and time and any passwords. See "Using the Setup Utility" in the *ThinkStation User Guide*.

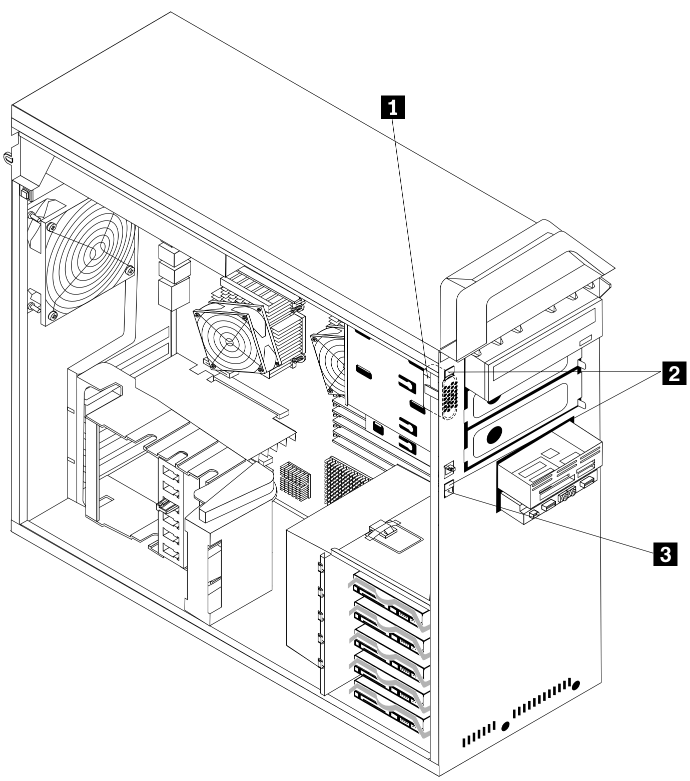
Replacing the internal speaker

Attention

Do not open your computer or attempt any repair before reading and understanding the “Important safety information” in the *ThinkStation Safety and Warranty Guide* that came with your computer. To obtain a copy of the *ThinkStation Safety and Warranty Guide*, go to:
http://www.lenovo.com/support.

This section provides instructions on how to replace the internal speaker.

1. Remove the computer cover. See “Removing the cover” on page 78.
2. Remove the front bezel. See “Removing the front bezel” on page 82.
3. Locate the internal speaker. See “Locations” on page 79.
4. Access system board components. Note the routing of the internal speaker cable and power LED cable, and then disconnect these cables from the system board. See “Locating parts on the system board ” on page 113.
5. Disengage the internal speaker locking tab **3** and slide the internal speaker **1** downwards to completely remove it from the chassis.



6. Route the new internal speaker cable and power LED cable, and then position the two internal speaker latches **2** into the metal slots in the chassis, then push the internal speaker upwards until it snaps into position.

7. Connect the internal speaker cable and the power LED cable to the system board. See “Locating parts on the system board ” on page 113.
8. Reinstall the hard disk drive fan bracket if removed.
9. Reinstall the front bezel.
10. Go to “Completing the FRU replacement” on page 108.

Completing the FRU replacement

After replacing FRUs, you need to install any removed parts, replace the cover, and reconnect any cables, including telephone lines and power cords. Also, depending on the FRU that is replaced, you might need to confirm the updated information in the Setup Utility program.

Note: When the power cord is first plugged in, the computer might appear to turn on for a few seconds and then turn off. This is a normal sequence to enable the computer to initialize.

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your computer.
2. Replace the cover.
3. Reconnect the external cables and power cords to the computer. See “Rear connectors” on page 109.
4. If you have replaced the system board, you must update (flash) the BIOS. See “Flash update procedures” on page 251.
5. Some FRU replacements require the configuration to be updated. See Chapter 6 “Using the Setup Utility” on page 41.

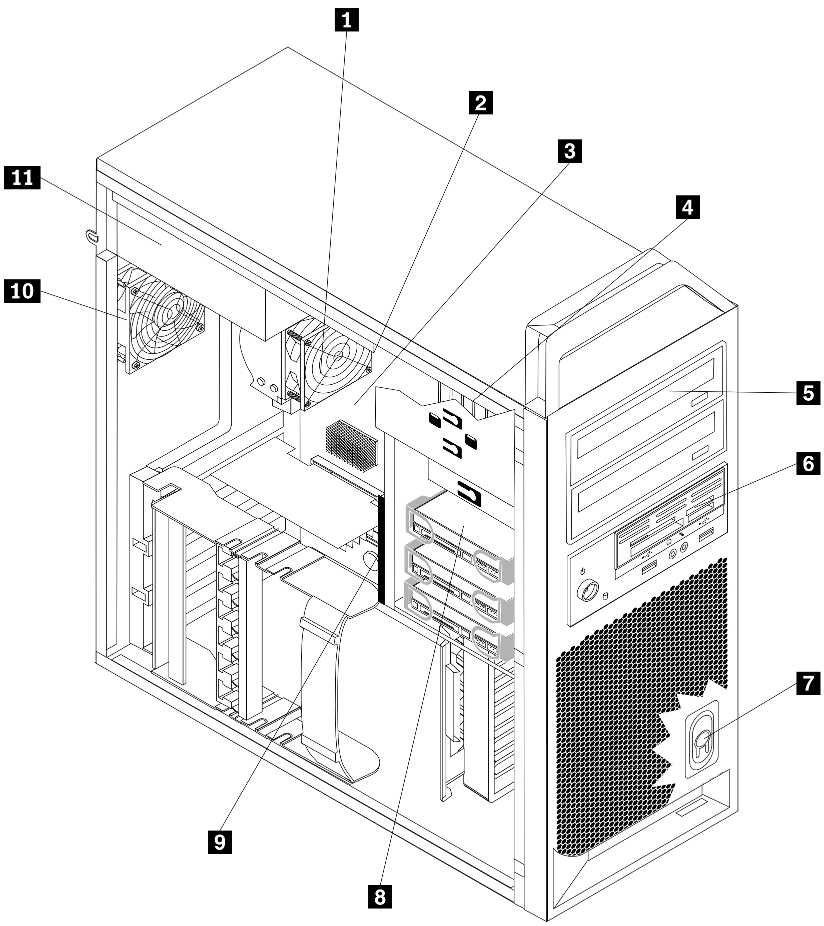
Chapter 12. FRU lists

Attention: Read “Important information about replacing RoHS compliant FRUs” on page 1 before replacing any FRUs.

Note: In the following tables, a CRU (Customer Replaceable Unit) is identified as either "1", "2", or "N" in the CRU column. "N" means that the part is not a CRU, "1" means that the part is a Self-service CRU, and "2" means that the part is an Optional-service CRU.

Overall: MT 4105, 4157 and 4217

The following replaceable components are available for the 4105, 4157 and 4217 machine type models.



Item #	FRUs	FRU #	CRU
1	Heat sink, Bloomfield performance • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5578	2
1	Heat sink, Bloomfield workstation • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5580	2
2	Microprocessor, Intel Xeon W3520 - 2.66Ghz, Quad Core - 4.8 QPI, 4MB L2, DDR3-1066, Turbo, SMT, 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6405	N
2	Microprocessor, Intel Xeon W3530 - Quad Core - 2.8GHz - 4.8 QPI, 8MB Cache, DDR3-1066, Turbo, HT, 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y9027	N
2	Microprocessor, Intel Xeon W3540 - 2.93GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6406	N
2	Microprocessor, Intel Xeon W3570 - 3.20GHz, Quad Core- 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6407	N
2	Microprocessor, Intel Xeon W3550 - Quad Core - 3.06GHz - 4.8 QPI, 8MB Cache, DDR3-1066, Turbo, SMT, 130W • MT 4105: CTO N5M J6G J7G P8M P9M O4G O5G O6G O7G R9U R9F O1U O1F 1CG 1FC 2MJ 2NJ 2OJ • MT 4157: F3G F4G G8G L9U L9F M6G M8M M9M N4U N4F N5U N5F 8AU 8AF 3BJ • MT 4217: CTO	64Y9827	N
2	Microprocessor, Intel Xeon W3580 - Quad Core -3.33GHZ - 6.4 QPI, 8MB Cache, DDR3 1333, Turbo, SMT, 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y9829	N

Item #	FRUs	FRU #	CRU
2	Microprocessor, Intel Xeon E5502 - 1.86GHz, Dual Core 4.8 QPI, 4MB L2, DDR3-800, 80W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6630	N
2	Microprocessor, Intel Xeon E5503 - Dual Core - 2.00GHz - 4.8 QPI DDR3-800-4MB 80W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y9029	N
2	Microprocessor, Intel Xeon E5504 - 2.00GHz, Quad Core- 4.8QPI, 4MB L2, DDR3-800, 80W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6631	N
2	Microprocessor, Intel Xeon E5506 - 2.13GHz, Quad Core - 4.8QPI, 4MB L2, DDR3-800, 80W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6632	N
2	Microprocessor, Intel Xeon E5507 - Quad Core - 2.26GHz - 4.8 QPI DDR3-800-4MB 80W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y9031	N
2	Microprocessor, Intel Xeon E5520 - 2.26GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W • MT 4105: CTO • MT 4157: CTO J9M • MT 4217: CTO	46R6633	N
2	Microprocessor, IIntel Xeon E5530 - 2.40GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6634	N
2	Microprocessor, Intel Xeon E5620 - Quad Core - 2.40GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W • MT 4105: CTO E6G F8A F8Q F8T F8H F8V F8K F8R 1GB 1GH • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R • MT 4217: CTO	71Y9049	N

Item #	FRUs	FRU #	CRU
2	Microprocessor, Intel Xeon E5630 - Quad Core - 2.53GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y9047	N
2	Microprocessor, Intel Xeon E5640 - Quad Core - 2.66GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y9045	N
2	Microprocessor, Intel Xeon X5550 - 2.66GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6638	N
2	Microprocessor, Intel Xeon X5560 - 2.80GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6639	N
2	Microprocessor, Intel Xeon X5650 - 6 Core - 2.66GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W • MT 4105: CTO E9G F5G • MT 4157: CTO • MT 4217: CTO	71Y9043	N
2	Microprocessor, Intel Xeon X5660 - 6 Core - 2.80GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y9041	N
2	Microprocessor, Intel Xeon X5667 - Quad Core - 3.06GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y9039	N
2	Microprocessor, Intel Xeon X5570 - 2.93GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6640	N

Item #	FRUs	FRU #	CRU
2	Microprocessor, Intel Xeon X5680 - 6 Cores - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y9033	N
2	Microprocessor, Intel Xeon X5677 - Quad Core - 3.46GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y9035	N
2	Microprocessor, Intel Xeon X5670 - 6 Core - 2.93GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W • MT 4105: CTO F1G F4G • MT 4157: CTO • MT 4217: CTO	71Y9037	N
2	Microprocessor, Intel Xeon W5580 - 3.20GHz, Quad Core 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W • MT 4105: CTO 16U 16F • MT 4157: CTO • MT 4217: CTO	46R6641	N
2	Microprocessor, Intel Xeon W5590 - Quad Core - 3.33GHZ - 6.4 QPI, 8MB Cache, DDR3 - 1333, Turbo, HT, 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y9831	N
2	Microprocessor, Intel Xeon W3503 - Dual Core - 2.4Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W • MT 4105: CTO 96G M2G K7G K7C 1EM 2FU 2FF 3AU 3AF • MT 4157: CTO 9AU 9AF • MT 4217: CTO	63Y9159	N
2	Microprocessor, Intel Xeon W3505 - Dual Core - 2.53Ghz - 4.8 QPI, 4MB L2, DDR3-1066, 130W • MT 4105: CTO O3U O3F • MT 4157: CTO • MT 4217: CTO	63Y9161	N
2	Microprocessor, Intel Xeon W3680 - 6 Core - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y9025	N

Item #	FRUs	FRU #	CRU
2	Microprocessor, Intel Xeon W3565 - Quad Core - 3.2GHz - 4.8 QPI, 8MB Cache, DDR3-1066, 130W • MT 4105: CTO D2G N7M L4H P1G P2G 2AG 2BG 2CG 2DG 2KJ 2LJ 3CG 4CG 5CU 5CF 6CU 6CF 8CG 9CG 4AG • MT 4157: CTO 4BJ 5BJ • MT 4217: CTO	71Y8842	N
2	Microprocessor, Intel Xeon E5603 - Quad Core - 1.6Ghz - 4.8 QPI, 4MB Cache, DDR3 - 1066, No HT, No Turbo, 80W • MT 4105: CTO • MT 4157: CTO J8M K2M F6G G6G 1AG 2AG 6AG 1BJ 2BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ 3CG • MT 4217: CTO	03T8032	N
2	Microprocessor, Intel Xeon E5606 - Quad Core - 2.13Ghz - 4.8 QPI, 8MB Cache, DDR3 - 1066, No HT, No Turbo, 80W • MT 4105: CTO • MT 4157: CTO N1U N1F • MT 4217: CTO	03T8031	N
2	Microprocessor, Intel Xeon E5607 - Quad Core - 2.26Ghz - 4.8 QPI, 8MB Cache, DDR3 - 1066, No HT, No Turbo, 80W • MT 4105: CTO 1KU 1KF 2EU 2EF • MT 4157: CTO • MT 4217: CTO	03T8030	N
2	Microprocessor, Intel Xeon E5645 - 6 Core - 2.4Ghz - 5.86 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 80W • MT 4105: CTO 2PH 4BH • MT 4157: CTO N2U N2F 7AU 7AF • MT 4217: CTO	03T8029	N
2	Microprocessor, Intel Xeon E5649 - 6 Core - 2.53Ghz - 5.86 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 80W • MT 4105: CTO 3BH • MT 4157: CTO • MT 4217: CTO	03T8027	N
2	Microprocessor, Intel Xeon X5647 - Quad Core - 2.93Ghz - 5.86 QPI, 12MB Cache, DDR3 - 1066, Turbo, HT, 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T8028	N
2	Microprocessor, Intel Xeon X5672 - Quad Core - 3.2Ghz - 6.4 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 95W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T8026	N

Item #	FRUs	FRU #	CRU
2	Microprocessor, Intel Xeon X5675 - 6 Core - 3.06Ghz - 6.4 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 95W • MT 4105: CTO 2RH • MT 4157: CTO • MT 4217: CTO	03T8025	N
2	Microprocessor, Intel Xeon X5687 - Quad Core - 3.6Ghz - 6.4 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T8024	N
2	Microprocessor, Intel Xeon X5690 - 6 Core - 3.46Ghz - 6.4 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T8023	N
2	Microprocessor, Intel Xeon W3670 - 6 Core - 3.2Ghz - 6.4 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 130W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T8021	N
2	Microprocessor, Intel Xeon W3690 - 6 Core - 3.46Ghz - 6.4 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 130W • MT 4105: CTO 1LM 2GJ 2HJ 2JJ 7CM • MT 4157: CTO 4BJ 5BJ • MT 4217: CTO	03T8022	N
2	Microprocessor, Intel Xeon E5540 - Quad Core - 2.53GHz - 5.86 QPI, 8MB Cache, DDR3-1066, Turbo, HT, 80W • MT 4105: CTO • MT 4157: CTO N7M N3U N3F N6U N6F 3AG 4AG 5AG 6BJ 7BJ 3DG 5CG • MT 4217: CTO	46R6635	N
2	Microprocessor, Intel Xeon L5630 - Quad Core - 2.13GHz - 5.86 QPI, 12MB Cache, DDR3-1066, Turbo, HT, 40W • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T8045	N

Item #	FRUs	FRU #	CRU
3	System board, Menorca - 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.35 , TPM enabled) • MT 4105: CTO 96G D2G M2G N5M N7M L4H E6G E9G F1G F4G F5G F8A F8Q F8T F8H F8V F8K F8R J6G J7G K7G K7C P8M P9M R1J P1G P2G O4G O5G O6G O7G R9U R9F O1U O1F O3U O3F1CG 1EM 1FC 1GB 1GH 1LM 1KU 1KF 2AG 2BG 2CG 2DG 2EU 2EF 2FU 2FF 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ 2PH 2RH 3AU 3AF 3BH • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M6G M8M M9M N7M N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ • MT 4217: CTO	71Y8819	N
3	System board, Menorca - 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.35, TPM disabled) • MT 4105: 96G M2G E6G E9G F1G F4G F5G P1G P2G O6G O7G 1CG 1GB 2AG 2BG 2CG 2DG • MT 4157: CTO 1AG 2AG 3AG 4AG 5AG 6AG 2CG • MT 4217: CTO	71Y8823	N
3	System board, Menorca - 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.45, TPM enabled) • MT 4105: CTO 96G D2G M2G N5M N7M L4H E6G E9G F1G F4G F5G F8A F8Q F8T F8H F8V F8K F8R J6G J7G K7G K7C P8M P9M R1J P1G P2G O4G O5G O6G O7G R9U R9F O1U O1F O3U O3F1CG 1EM 1FC 1GB 1GH 1LM 1KU 1KF 2AG 2BG 2CG 2DG 2EU 2EF 2FU 2FF 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ 2PH 2RH 3AU 3AF 3BH • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M6G M8M M9M N7M N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ • MT 4217: CTO	71Y8820	N
3	System board, Menorca - 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (v1.45, TPM disabled) • MT 4105: 96G M2G E6G E9G F1G F4G F5G P1G P2G O6G O7G 1CG 1GB 2AG 2BG 2CG 2DG • MT 4157: CTO 1AG 2AG 3AG 4AG 5AG 6AG 2CG • MT 4217: CTO	71Y8824	N

Item #	FRUs	FRU #	CRU
3	System board, Menorca - 1P Intel X58 LGA 1366 , Tylersburg 36S, ICH10R • MT 4105: 3CG 4CG 5CU 5CF 6CU 6CF 7CM 8CG 9CG 4AG 4BH • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M6G M8M M9M N7M N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ 3CG 3DG 5CG • MT 4217: CTO	46R4544	N
3	System board, Menorca - 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (Russia only) • MT 4105: 96G M2G E6G E9G F1G F4G F5G P1G P2G O6G O7G 1CG 1GB 2AG 2BG 2CG 2DG • MT 4157: CTO 1AG 2AG 3AG 4AG 5AG 6AG 2CG • MT 4217: CTO	64Y6337	N
3	System board, Menorca - 1P Intel LGA 1366 , Tylersburg 36S, ICH10R (New SOVP level) • MT 4105: • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M6G M8M M9M N7M N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ • MT 4217: CTO	64Y6590	N
3	System board, Menorca - 1P Intel LGA 1366 , Tylersburg 36S, ICH10R • MT 4105: CTO 96G D2G M2G N5M N7M L4H E6G E9G F1G F4G F5G F8A F8Q F8T F8H F8V F8K F8R J6G J7G K7G K7C P8M P9M R1J P1G P2G O4G O5G O6G O7G R9U R9F O1U O1F O3U O3F1CG 1EM 1FC 1GB 1GH 1LM 1KU 1KF 2AG 2BG 2CG 2DG 2EU 2EF 2FU 2FF 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ 2PH 2RH 3AU 3AF 3BH • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M6G M8M M9M N7M N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ • MT 4217: CTO	64Y7517	N
4	Memory module, 1GB DDR3 ECC UDIMM PC3-10600 (1333MHz) • MT 4105: CTO • MT 4157: CTO B5A B5Q B5T B5K B5R • MT 4217: CTO	46R6026	1

Item #	FRUs	FRU #	CRU
4	Memory module, 2GB DDR3 ECC UDIMM PC3-10600 (1333MHz) • MT 4105: CTO D2G M2G N5M N7M L4H E9G F1G F4G F5G J6G J7G P8M P9M P1G P2G O4G O5G O6G O7G R9U R9F O1U O1F O3U O3F 1CG 1EM 1FC 1GB 1GH 1LM 1KU 1KF 2AG 2BG 2CG 2DG 2EU 2EF 2FU 2FF 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ 2PH 3AU 3AF 3CG 4CG 7CM 8CG 9CG 4AG 4BH • MT 4157: CTO J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M6G M8M M9M N7M N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ 3CG 3DG 5CG • MT 4217: CTO	46R6027	1
4	Memory module, 4GB DDR3 ECC UDIMM (9-9-9) PC3-10600 (1333MHz) • MT 4105: CTO 2RH 3BH 5CU 5CF 6CU 6CF • MT 4157: CTO • MT 4217: CTO	64Y9570	1
4	Memory module, 1GB DDR3 ECC UDIMM PC3-8500 (1066MHz) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	53Y6195	1
4	Memory module, 2GB DDR3 ECC UDIMM PC3-8500 (1066MHz) • MT 4105: CTO 96G E6G F8A F8Q F8T F8H F8V F8K F8R K7G K7C • MT 4157: CTO C3B C3H C3V B4G • MT 4217: CTO	53Y6197	1
4	Memory module, 8GB DDR3 ECC UDIMM (9-9-9) PC3-10600 (1333MHz) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T8429	1
5	Optical drive, DVD-ROM drive - 16x/48x (SATA) - DOS/Linux • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41N3325	1
5	Optical drive, DVD-ROM drive - 16x/48x (SATA) - DOS/Linux • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y5543	1

Item #	FRUs	FRU #	CRU
5	Optical drive, DVD burner/CD-RW Rambo 8 (SATA) - DOS/Linux • MT 4105: CTO 96G D2G M2G N5M N7M L4H E6G E9G F1G F4G F5G F8A F8Q F8T F8H F8V F8K F8R J6G J7G K7G K7C P8M P9M P1G P2G O4G O5G O6G O7G R9U R9F O1U O1F O3U O3F 1CG 1EM 1FC 1GB 1GH 1LM 1KU 1KF 2AG 2BG 2CG 2DG 2EU 2EF 2FU 2FF 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ 2PH 2RH 3AU 3AF 3BH 3CG 4CG 5CU 5CF 6CU 6CF 7CM 8CG 9CG 4AG 4BH • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M6G M8M M9M N7M N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ 3CG 3DG 5CG • MT 4217: CTO	43C1042	1
5	Optical drive, DVD burner/CD-RW Rambo 8 (SATA) - DOS/Linux • MT 4105: CTO 96G D2G M2G N5M N7M L4H E6G E9G F1G F4G F5G F8A F8Q F8T F8H F8V F8K F8R J6G J7G K7G K7C P8M P9M P1G P2G O4G O5G O6G O7G R9U R9F O1U O1F O3U O3F 1CG 1EM 1FC 1GB 1GH 1LM 1KU 1KF 2AG 2BG 2CG 2DG 2EU 2EF 2FU 2FF 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ 2PH 2RH 3AU 3AF 3BH 3CG 4CG 5CU 5CF 6CU 6CF 7CM 8CG 9CG 4AG 4BH • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M6G M8M M9M N7M N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ 3CG 3DG 5CG • MT 4217: CTO	71Y5545	1
5	Optical drive, Blu-ray with AACS bus encryption • MT 4105: • MT 4157: • MT 4217: CTO	03T8423	1
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-ALPS • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	40Y9105	1
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD-SONY • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	40Y9107	1
7	FRU, power switch, LED cable and power button kit • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5651	2

Item #	FRUs	FRU #	CRU
8	Hard disk drive, 250GB SATA - 7200 rpm, 8MB cache, 3.5" • MT 4105: CTO M2G • MT 4157: CTO • MT 4217: CTO	46R6029	1
8	Hard disk drive, 500GB SATA - 7200 rpm, 3 Gb/s, 16MB cache, 3.5" • MT 4105: CTO 96G D2G N5M N7M L4H F1G F8A F8Q F8T F8H F8V F8K F8R J6G K7G K7C O4G O5G R9U R9F O1U O1F O3U O3F 1EM 1FC 1GB 1GH 1KU 1KF 2EU 2EF 2FU 2FF 2GJ 2HJ 2KJ 2MJ 2NJ 2OJ 3AU 3AF 5CU 5CF 7CM 8CG 9CG 4AG 4BH • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M9M N1U N1F N2U N2F N3U N3F 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 3BJ 4BJ 8BU 8BF 9BU 9BF 1CU 1CF 3DG 5CG • MT 4217: CTO	46R6030	1
8	Hard disk drive, 750GB SATA - 7200 rpm, 3 Gb/s, 16MB cache, 3.5" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	43C3671	1
8	Hard disk drive, 1TB SATA - 7200 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4105: CTO P1G 1LM 2AG 2BG 2CG 2DG 2PH 2RH 3BH • MT 4157: CTO 3AG 5AG • MT 4217: CTO	46R6031	1
8	Hard disk drive, 74GB SATA - 10000 rpm, 3 Gb/s, 16MB cache, 2.5" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6032	2
8	Hard disk drive, 150GB SATA - 10000 rpm, 3 Gb/s, 16MB cache, 2.5" • MT 4105: CTO F4G F5G J7G P2G O6G O7G • MT 4157: CTO • MT 4217: CTO	46R6400	2
8	Hard disk drive, 300GB SATA - 10000 rpm, 3 Gb/s, 16MB cache, 2.5" • MT 4105: CTO • MT 4157: • MT 4217: CTO	46R6401	2
8	Hard disk drive, 147GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6033	1
8	Hard disk drive, 147GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	45K0608	1

Item #	FRUs	FRU #	CRU
8	Hard disk drive, 300GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4105: CTO 1CG 2DG • MT 4157: CTO M6G M8M N4U N4F N5U N5F N6U N6F 2BJ 5BJ 6BJ • MT 4217: CTO	43C6969	1
8	Hard disk drive, 300GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4105: CTO 1CG 2DG • MT 4157: CTO M6G M8M N4U N4F N5U N5F N6U N6F 2BJ 5BJ 6BJ • MT 4217: CTO	45K0609	1
8	Hard disk drive, 300GB SAS - 15000 rpm, 6 Gb/s, 32MB cache, 3.5" • MT 4105: CTO 1CG 2DG • MT 4157: CTO M6G M8M N4U N4F N5U N5F N6U N6F 2BJ 5BJ 6BJ • MT 4217: CTO	03X3621	1
8	Hard disk drive, 450GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4105: CTO 6CU 6CF • MT 4157: CTO N7M 1AG 4AG 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ • MT 4217: CTO	45J4899	1
8	Hard disk drive, 450GB SAS - 15000 rpm, 32MB cache, 3.5" • MT 4105: CTO 6CU 6CF • MT 4157: CTO N7M 1AG 4AG 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ • MT 4217: CTO	03X3622	1
8	Hard disk drive, 128GB SATA solid state drive (SSD) - MLC, 1.8" • MT 4105: CTO • MT 4157: CTO M6G • MT 4217: CTO	45N7953	1
8	Hard disk drive, 128GB SATA solid state drive (SSD) - MLC, 1.8" • MT 4105: CTO • MT 4157: CTO M6G • MT 4217: CTO	45N8203	1
8	Hard disk drive, 256GB SATA solid state drive (SSD) - MLC, 1.8" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	45N7959	1
8	Hard disk drive, 256GB SATA solid state drive (SSD) - MLC, 1.8" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	45N8207	1

Item #	FRUs	FRU #	CRU
8	Hard disk drive, 160GB SATA solid state drive (SSD) - MLC, 1.8" • MT 4105: CTO P8M P9M • MT 4157: CTO 2AG • MT 4217: CTO	45N7963	1
8	Hard disk drive, 160GB SATA solid state drive (SSD) - MLC, 1.8" • MT 4105: CTO P8M P9M • MT 4157: CTO 2AG • MT 4217: CTO	45N8019	1
8	Hard disk drive, 2TB SATA - 7200 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	45K0610	1
8	Hard disk drive, 1TB SATA - 7200 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4105: CTO 1LM 2AG 2BG 2CG 2DG 2PH 2RH 3BH • MT 4157: CTO 3AG 5AG • MT 4217: CTO	45K0412	1
8	Hard disk drive, 128GB SATA solid state drive (SSD), 2.5" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	45K0617	1
8	Hard disk drive, 256GB SATA solid state drive (SSD), 2.5" • MT 4105: CTO 4CG • MT 4157: CTO 3CG • MT 4217: CTO	45K0618	1
8	Hard disk drive, 160GB SATA solid state drive (SSD) - MLC-SM160, 2.5" • MT 4105: CTO 2JJ 2LJ 3CG • MT 4157: CTO 2AG 7BJ • MT 4217: CTO	03T7026	1
8	Hard disk drive, 160GB SATA solid state drive (SSD) - MLC-SM160, 2.5" • MT 4105: CTO 2JJ 2LJ 3CG • MT 4157: CTO 2AG 7BJ • MT 4217: CTO	45K0616	1
8	Hard disk drive, 600GB SATA - 10000 rpm, 16MB cache, 2.5" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	91Y1658	1
8	Hard disk drive, 600GB SAS - 15000 rpm, 3.5" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03X3616	1

Item #	FRUs	FRU #	CRU
8	Hard disk drive, 600GB SAS - 15000 rpm, 3.5" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03X3623	1
8	Hard disk drive, 250GB SATA - 7200 rpm, 3.5" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T7039	1
8	Hard disk drive, 500GB SATA - 7200 rpm, 3.5" • MT 4105: CTO 5CU 5CF 7CM 8CG 9CG 4AG 4BH • MT 4157: CTO 3DG 5CG • MT 4217: CTO	03T7041	1
8	Hard disk drive, 1TB SATA - 7200 rpm, 3.5" • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T7042	1
10	Rear fan, exhaust fan assembly • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5583	2
11	Power supply, 625 Watt power supply • MT 4105: CTO 96G D2G M2G N5M N7M L4H E6G E9G F1G F4G F5G F8A F8Q F8T F8H F8V F8K F8R J6G J7G K7G K7C P8M P9M R1J P1G P2G O4G O5G O6G O7G R9U R9F O1U O1F O3U O3F1CG 1EM 1FC 1GB 1GH 1LM 1KU 1KF 2AG 2BG 2CG 2DG 2EU 2EF 2FU 2FF 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ 2PH 2RH 3AU 3AF 3BH 3CG 4CG 5CU 5CF 6CU 6CF 7CM 8CG 9CG 4AG 4BH • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M6G M8M M9M N7M N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ 3CG 3DG 5CG • MT 4217: CTO	41A9758	2

Mechanical FRUs

The FRUs listed in the following tables are not illustrated.

FRUs	FRU #	CRU
FRU, PS2 keyboard/mouse card and cable assembly • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5604	2
FRU, adapter bracket, 2.5 to 3.5 hard disk drive • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5625	2
FRU, EMC shield assembly • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5621	2
FRU, label, Martell 2/Menorca Information • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5626	1
FRU, FDD cable - Martell-2 • MT 4105: all models • MT 4157: all models • MT 4217: all models	41N8294	2
FRU, RM assembly • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5592	2
FRU, cable assembly, SAS LED with diodes • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5696	2
FRU, handle with screws • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5490	1
FRU, cable assembly, hard disk drive SATA, Martell • MT 4105: all models • MT 4157: all models • MT 4217: all models	41N8298	2
FRU, cable assembly, SAS hard disk drive • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5482	2

FRUs	FRU #	CRU
FRU, Martell access cover assembly with tape • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5670	2
FRU, speaker cable assembly • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5494	2
FRU, thermal sense cable • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R2511	2
FRU, system board screw kit • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5547	2
FRU, cable assembly, SATA optical drive • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5517	2
FRU, Martell 2 FPIO cable and bezel assembly kit (no 1394) • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5690	2
FRU, mechanical shell kit, Martell 2, no 1394 • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5691	2
FRU, PS/2 card and bracket assembly • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5694	2
FRU, PS/2 cable assembly • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5604	2
FRU, SAS hard disk drive filler • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5552	2

FRUs	FRU #	CRU
FRU, handle filler with screws • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5699	2
FRU, retainer, 3.5" device • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5614	2
FRU, SSD mounting kit • MT 4105: all models • MT 4157: all models • MT 4217: all models	43N9593	2
FRU, hard disk drive SATA cable - Camus • MT 4105: all models • MT 4157: all models • MT 4217: all models	43N9134	2
FRU, second serial port cable • MT 4105: all models • MT 4157: all models • MT 4217: all models	41R5544	2

Keyboard and Mouse

Keyboard - USB Preferred Pro Full size	FRU #	CRU
US English • MT 4105: CTO 96G D2G M2G N5M N7M L4H E6G E9G F1G F4G F5G F8A F8Q F8H F8R J6G J7G K7G P8M P9M P1G P2G O4G O5G O6G O7G R9U O1U O3U 1CG 1EM 1GH 1LM 1KU 2EU 2FU 2PH 2RH 3AU 3BH 7CM 5CU 6CU 4BH 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO C3H B4G B5A B5Q B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U M6G M8M M9M N7M N1U N2U N3U N4U N5U N6U 7AU 8AU 9AU 8BU 9BU 1CU 2CU 2CL 2CM 2CA 2CQ 2CH 2CR 2CE 2CH 3CG 3DG 5CG • MT 4217: CTO	41A5289	1
Arabic • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5290	1
Arabic/French • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41A5291	1

Keyboard - USB Preferred Pro Full size	FRU #	CRU
Belgian/French • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5292	1
Belgian/UK • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5293	1
Brazilian • MT 4105: CTO • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5294	1
Bulgarian • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5295	1
Hong Kong/Taiwan • MT 4105: • MT 4157: CTO 2CB 2CV • MT 4217: CTO	41A5296	1
Czech • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5297	1
Danish • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5298	1
Dutch • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5299	1

Keyboard - USB Preferred Pro Full size	FRU #	CRU
French • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G J8G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5300	1
French Canadian • MT 4105: R9FO1F O3F 1KF 2EF 2FF 3AF 5CF 6CF • MT 4157: CTO L9F N1F N2F N3F N4F N5F N6F 7AF 8AF 9AF 8BF 9BF 1CF 2CF • MT 4217: CTO	41A5301	1
French Canadian • MT 4105: R9FO1F O3F 1KF 2EF 2FF 3AF 5CF 6CF • MT 4157: CTO L9F N1F N2F N3F N4F N5F N6F 7AF 8AF 9AF 8BF 9BF 1CF 2CF	41A5302	1
German • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5303	1
Greek • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5304	1
Greek/US • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5305	1
Hebrew • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5306	1
Hungarian • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5307	1

Keyboard - USB Preferred Pro Full size	FRU #	CRU
Iceland • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5308	1
Italy • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5309	1
Japanese • MT 4105: CTO 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ • MT 4157: CTO 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 2CJ • MT 4217: CTO	41A5310	1
Korean • MT 4105: CTO F8K • MT 4157: CTO B5K 2CK • MT 4217: CTO	41A5311	1
LA Spanish • MT 4105: CTO • MT 4157: CTO 2CS 2CD 2CY • MT 4217: CTO	41A5312	1
Norwegian • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5313	1
Polish • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5314	1
Portuguese • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5315	1

Keyboard - USB Preferred Pro Full size	FRU #	CRU
Romanian • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5317	1
Romanian • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5316	1
Russian/Cyrillic • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5318	1
Serbian/Cyrillic • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5319	1
Slovak • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5320	1
Spanish • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5321	1
Swedish/Finnish • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5322	1

Keyboard - USB Preferred Pro Full size	FRU #	CRU
Swiss French/German • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5323	1
Thailand • MT 4105: CTO F8T • MT 4157: CTO B5T 2CT • MT 4217: CTO	41A5324	1
Turkish • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5325	1
Turkish • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5326	1
UK English • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5327	1
US European • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5328	1
Slovenian • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	41A5329	1

Keyboard - Full Size PS/2	FRU #	CRU
US English • MT 4105: • MT 4157: • MT 4217:	41A5039	1
Arabic • MT 4105: • MT 4157: • MT 4217:	41A5040	1
Arabic/French • MT 4105: • MT 4157: • MT 4217:	41A5041	1
Belgian/French • MT 4105: • MT 4157: • MT 4217:	41A5042	1
Belgian/UK • MT 4105: • MT 4157: • MT 4217:	41A5043	1
Brazilian • MT 4105: • MT 4157: • MT 4217:	41A5044	1
Bulgarian • MT 4105: • MT 4157: • MT 4217:	41A5045	1
Hong Kong/Taiwan • MT 4105: • MT 4157: • MT 4217:	41A5046	1
Czech • MT 4105: • MT 4157: • MT 4217:	41A5047	1
Danish • MT 4105: • MT 4157: • MT 4217:	41A5048	1

Keyboard - Full Size PS/2	FRU #	CRU
Dutch • MT 4105: • MT 4157: • MT 4217:	41A5049	1
French • MT 4105: • MT 4157: • MT 4217:	41A5050	1
French Canadian • MT 4105: • MT 4157: • MT 4217:	41A5051	1
French Canadian • MT 4105: • MT 4157: • MT 4217:	41A5052	1
German • MT 4105: • MT 4157: • MT 4217:	41A5053	1
Greek • MT 4105: • MT 4157: • MT 4217:	41A5054	1
Greek/US • MT 4105: • MT 4157: • MT 4217:	41A5080	1
Hebrew • MT 4105: • MT 4157: • MT 4217:	41A5055	1
Hungarian • MT 4105: • MT 4157: • MT 4217:	41A5056	1
Iceland • MT 4105: • MT 4157: • MT 4217:	41A5057	1

Keyboard - Full Size PS/2	FRU #	CRU
Italy • MT 4105: • MT 4157: • MT 4217:	41A5058	1
Japanese • MT 4105: • MT 4157: • MT 4217:	41A5059	1
Korean • MT 4105: • MT 4157: • MT 4217:	41A5060	1
LA Spanish • MT 4105: • MT 4157: • MT 4217:	41A5061	1
Norwegian • MT 4105: • MT 4157: • MT 4217:	41A5062	1
Polish • MT 4105: • MT 4157: • MT 4217:	41A5063	1
Portuguese • MT 4105: • MT 4157: • MT 4217:	41A5064	1
Romanian • MT 4105: • MT 4157: • MT 4217:	41A5065	1
Russian/Cyrillic • MT 4105: • MT 4157: • MT 4217:	41A5066	1
Serbian/Cyrillic • MT 4105: • MT 4157: • MT 4217:	41A5067	1

Keyboard - Full Size PS/2	FRU #	CRU
Slovak • MT 4105: • MT 4157: • MT 4217:	41A5068	1
Spanish • MT 4105: • MT 4157: • MT 4217:	41A5069	1
Swedish/Finnish • MT 4105: • MT 4157: • MT 4217:	41A5070	1
Swiss French/German • MT 4105: • MT 4157: • MT 4217:	41A5071	1
Thailand • MT 4105: • MT 4157: • MT 4217:	41A5072	1
Turkish • MT 4105: • MT 4157: • MT 4217:	41A5073	1
Turkish • MT 4105: • MT 4157: • MT 4217:	41A5074	1
UK English • MT 4105: • MT 4157: • MT 4217:	41A5075	1
US European • MT 4105: • MT 4157: • MT 4217:	41A5076	1
Slovenian • MT 4105: • MT 4157: • MT 4217:	41A5077	1

Keyboard - Enhanced Performance	FRU #	CRU
US English • MT 4105: • MT 4157: • MT 4217:	41A4961	1
Arabic • MT 4105: • MT 4157: • MT 4217:	41A4962	1
Arabic/French • MT 4105: • MT 4157: • MT 4217:	41A4963	1
Belgian/French • MT 4105: • MT 4157: • MT 4217:	41A4964	1
Belgian/UK • MT 4105: • MT 4157: • MT 4217:	41A4965	1
Brazilian • MT 4105: • MT 4157: • MT 4217:	41A4966	1
Bulgarian • MT 4105: • MT 4157: • MT 4217:	41A4967	1
Hong Kong/Taiwan • MT 4105: • MT 4157: • MT 4217:	41A4968	1
Czech • MT 4105: • MT 4157: • MT 4217:	41A4969	1
Danish • MT 4105: • MT 4157: • MT 4217:	41A4970	1

Keyboard - Enhanced Performance	FRU #	CRU
Dutch • MT 4105: • MT 4157: • MT 4217:	41A4971	1
French • MT 4105: • MT 4157: • MT 4217:	41A4972	1
French Canadian • MT 4105: • MT 4157: • MT 4217:	41A4973	1
French Canadian • MT 4105: • MT 4157: • MT 4217:	41A4974	1
German • MT 4105: • MT 4157: • MT 4217:	41A4975	1
Greek • MT 4105: • MT 4157: • MT 4217:	41A4976	1
Greek/US • MT 4105: • MT 4157: • MT 4217:	41A5078	1
Hebrew • MT 4105: • MT 4157: • MT 4217:	41A4977	1
Hungarian • MT 4105: • MT 4157: • MT 4217:	41A4978	1
Iceland • MT 4105: • MT 4157: • MT 4217:	41A4979	1

Keyboard - Enhanced Performance	FRU #	CRU
Italy • MT 4105: • MT 4157: • MT 4217:	41A4980	1
Japanese • MT 4105: • MT 4157: • MT 4217:	41A4981	1
Korean • MT 4105: • MT 4157: • MT 4217:	41A4982	1
LA Spanish • MT 4105: • MT 4157: • MT 4217:	41A4983	1
Norwegian • MT 4105: • MT 4157: • MT 4217:	41A4984	1
Polish • MT 4105: • MT 4157: • MT 4217:	41A4985	1
Portuguese • MT 4105: • MT 4157: • MT 4217:	41A4986	1
Romanian • MT 4105: • MT 4157: • MT 4217:	41A4987	1
Russian/Cyrillic • MT 4105: • MT 4157: • MT 4217:	41A4988	1
Serbian/Cyrillic • MT 4105: • MT 4157: • MT 4217:	41A4989	1

Keyboard - Enhanced Performance	FRU #	CRU
Slovak • MT 4105: • MT 4157: • MT 4217:	41A4990	1
Spanish • MT 4105: • MT 4157: • MT 4217:	41A4991	1
Swedish/Finnish • MT 4105: • MT 4157: • MT 4217:	41A4992	1
Swiss French/German • MT 4105: • MT 4157: • MT 4217:	41A4993	1
Thailand • MT 4105: • MT 4157: • MT 4217:	41A4994	1
Turkish • MT 4105: • MT 4157: • MT 4217:	41A4995	1
Turkish • MT 4105: • MT 4157: • MT 4217:	41A4996	1
UK English • MT 4105: • MT 4157: • MT 4217:	41A4997	1
US European • MT 4105: • MT 4157: • MT 4217:	41A4998	1
Slovenian • MT 4105: • MT 4157: • MT 4217:	41A4999	1

Keyboard - USB Preferred Pro Fingerprint Keyboard	FRU #	CRU
US English • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0038	1
Arabic • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0039	1
Arabic/French • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0040	1
Belgium French • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0041	1
Belgium English • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0042	1
Brazilian Portuguese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0043	1
Bulgarian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0044	1
Chinese/US • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0045	1
Czech (ABB) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0046	1
Danish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0047	1

Keyboard - USB Preferred Pro Fingerprint Keyboard	FRU #	CRU
Dutch • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0048	1
French • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0049	1
French Canadian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0050	1
French Canadian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0051	1
German • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0052	1
Greek • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0053	1
Greek/US • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0054	1
Hebrew • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0055	1
Hungarian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0056	1
Iceland • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0057	1

Keyboard - USB Preferred Pro Fingerprint Keyboard	FRU #	CRU
Italy • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0058	1
Japanese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0059	1
Korean • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0060	1
LA Spanish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0061	1
Norwegian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0062	1
Polish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0063	1
Portuguese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0064	1
Romanian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0065	1
Romanian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0066	1
Russian/Cyrillic • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0067	1

Keyboard - USB Preferred Pro Fingerprint Keyboard	FRU #	CRU
Serbian/Cyrillic • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0068	1
Slovak • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0069	1
Spanish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0070	1
Swedish/Finnish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0071	1
Swiss French/German • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0072	1
Thailand • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0073	1
Turkish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0074	1
Turkish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0075	1
UK English • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0076	1

Keyboard - USB Preferred Pro Fingerprint Keyboard	FRU #	CRU
US European • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0077	1
Slovenian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41R0078	1

Mice	FRU #	CRU
Optical wheel mouse (400 DPI), USB - red wheel (Primary) • MT 4105: CTO 96G D2G M2G N5M N7M L4H E6G E9G F1G F4G F5G F8A F8Q F8T F8H F8V F8K F8R J6G J7G K7G K7C P8M P9M P1G P2G O4G O5G O6G O7G R9U R9F O1U O1F O3U O3F 1CG 1EM 1FC 1GB 1GH 1LM 1KU 1KF 2AG 2BG 2CG 2DG 2EU 2EF 2FU 2FF 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ 2PH 2RH 3AU 3AF 3BH 3CG 4CG 5CU 5CF 6CU 6CF 7CM 8CG 9CG 4AG 4BH • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M6G M8M M9M N7M N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ • MT 4217: CTO	41U3013	1
Optical wheel mouse (400 DPI), USB - red wheel (Secondary) • MT 4105: CTO 96G D2G M2G N5M N7M L4H E6G E9G F1G F4G F5G F8A F8Q F8T F8H F8V F8K F8R J6G J7G K7G K7C P8M P9M P1G P2G O4G O5G O6G O7G R9U R9F O1U O1F O3U O3F 1CG 1EM 1FC 1GB 1GH 1LM 1KU 1KF 2AG 2BG 2CG 2DG 2EU 2EF 2FU 2FF 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ 2PH 2RH 3AU 3AF 3BH 3CG 4CG 5CU 5CF 6CU 6CF 7CM 8CG 9CG 4AG 4BH • MT 4157: CTO C3B C3H C3V B4G B5A B5Q B5T B5K B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U L9F M6G M8M M9M N7M N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AU 7AF 8AU 8AF 9AU 9AF 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ • MT 4217: CTO	41U3030	1
3 button laser mouse (1600 DPI), USB • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41U3078	1
Optical wheel mouse (800 DPI), USB - red wheel • MT 4105: CTO 3CG 4CG 5CU 5CF 6CU 6CF 7CM 8CG 9CG 4AG 4BH • MT 4157: CTO • MT 4217: CTO	45J4889	1

Adapters and miscellaneous FRUs

Adapters and miscellaneous FRUs	FRU #	CRU
3.5" 20-in-1 media card reader (with GPIO detect) • MT 4105: CTO 96G • MT 4157: CTO • MT 4217: CTO	45R8139	1
L1 IEEE 1394 PCI adapter • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41D2781	1
Speakers (2-piece) Lenovo Logo (Secondary) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41A5334	1
Lenovo 3 pieces speakers (China only) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	45C8640	1
Lenovo 2 pieces speakers (China only) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	45C8641	1
Speaker power brick • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	89P8571	1
256MB NVIDIA NVS290 (DMS59 connector) - Quasar • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	42Y6329	1
256MB NVIDIA FX380 (DVI + DP) (Hard from 46R2784) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y6863	1
512MB NVIDIA FX580 (DVI + DP + DP) • MT 4105: CTO K7G K7C • MT 4157: CTO • MT 4217: CTO	46R2786	1

Adapters and miscellaneous FRUs	FRU #	CRU
768MB NVIDIA FX1800 (DVI + DP + DP) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R2788	1
1.5GB NVIDIA FX4800 (DVI + DP + DP + ST), 2x3 power connector . • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R2792	1
256MB NVIDIA NVS295 (dual DP) • MT 4105: CTO • MT 4157: CTO C3B C3H C3V B5A B5Q B5T B5K B5R • MT 4217: CTO	46R2782	1
1GB NVIDIA FX3800 (DVI + DP + ST), 2x3 power connector . • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	89Y0429	1
4GB NVIDIA FX5800 (DVI + DVI + DP + ST), 2*2X3 power connector • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R2794	1
256MB ATI FirePro V3700 (Dual DVI) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	53Y8569	1
512MB ATI FirePro V5700 (DP+DP+DVI) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	53Y8571	1
1GB ATI FirePro V7700 (DP+DP+DVI) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	53Y8573	1
Soft modem V.90/V.44 • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	29R9729	1
Dongle cable (DMS59 to dual DVI) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	41X6398	1

Adapters and miscellaneous FRUs	FRU #	CRU
Nvidia Tesla C1060 compute card (computer adapter) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R6041	1
SAS controller card - 3Gb/s, 4-port host bus adapter • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46R3460	1
SoundBlaster Titanium audio card (PCIe) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	46T0407	1
Modem phone cable • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	39K5120	1
DVI to VGA dongle • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	45C7816	1
DP to DVI dongle 200 mm • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	43N9160	1
512MB NVIDIA Quadro NVS 450 GDDR3 (DP+DP+DP+DP) • MT 4105: CTO 2NJ • MT 4157: CTO • MT 4217: CTO	64Y9895	1
Nvidia Quadro 2000, Dual link DVI, DP, DP, 1GB GDDR5 • MT 4105: CTO N5M N7M L4H P8M P9M O4G O7G R9U R9F 1LM 2CG 2HJ 2JJ 2KJ 2LJ 2PH 2RH 3BH • MT 4157: CTO 8M J9M F3G M6G M8M N1U N1F N3U N3F N5U N5F 1AG 1BJ 2BJ 3BJ 4BJ 1CU 1CF • MT 4217: CTO	89Y8856	1
Nvidia Quadro 4000, Dual link DVI, DP, DP, Stereo 3D 2GB GDDR5 • MT 4105: CTO O5G O6G 1FC 2GJ • MT 4157: CTO K2M F4G F6G G6G G8G N7M N3U N3F N6U N6F 5AG 6BJ 7BJ 2CU 2CF 2CS 2CP 2CL 2CD 2CY 2CG 2CM 2CA 2CQ 2CT 2CC 2CB 2CH 2CV 2CK 2CR 2CE 2CJ • MT 4217: CTO	89Y8627	1

Adapters and miscellaneous FRUs	FRU #	CRU
Nvidia Quadro 5000, dual link DVI, DP, DP, Stereo 3D 2.5GB GDDR5 • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	89Y8628	1
Nvidia Quadro 6000, dual link DVI, DP, DP, Stereo 3D 6GB GDDR5 • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	89Y8629	1
Nvidia Telsa 2050, 3GB GDDR5 • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	89Y8630	1
Nvidia Quadro 600, Dual link DVI, DP, 1GB GDDR3 • MT 4105: CTO O3U O3F 1EM 1GB 1GH 2BG 2MJ 3AU 3AF • MT 4157: CTO L9U L9F M9M N2U N2F 9BU 9BF • MT 4217: CTO	03T8009	1
512MB Nvidia NVS300 (DMS59 connector to dual DVI) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T8152	1
512MB Nvidia NVS300, PCIe x 1 (DMS59 connector to cual DVI) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T8039	1
Nvidia Quadro 400, DVI and DP only, 512MB • MT 4105: CTO 2EU 2EF 2FU 2FF • MT 4157: CTO 7AU 7AF 8AU 8AF 9AU 9AF 8BU 8BF • MT 4217: CTO	03T8040	1
Nvidia Quadro 2000D Dual DVI 1 GB GDDR5 • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03T8418	1

Power Cords

Power Cords	FRU #	CRU
Line Cord - US • MT 4105: CTO F8A F8T R9U R9F O1U O1F O3U O3F 1KU 1KF 2EU 2EF 2FU 2FF 3AU 3AF 5CU 5CF 6CU 6CF • MT 4157: CTO B5A B5T L9U L9F N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 7AU 7AF 8AU 8AF 9AU 9AF 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CL 2CD 2CA 2CT	41R3184	1

Power Cords	FRU #	CRU
• MT 4217: CTO		
Line Cord - China • MT 4105: CTO K7C 1FC • MT 4157: CTO 2CC • MT 4217: CTO	41R3256	1
Line Cord - Japan and Japanese English • MT 4105: CTO 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ • MT 4157: CTO 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 2CE 2CJ • MT 4217: CTO	41R3248	1
Line Cord - Brazil (Portuguese) • MT 4105: CTO • MT 4157: CTO 2CP • MT 4217: CTO	41R3270	1
Line Cord - LA high volt (APU) • MT 4105: CTO • MT 4157: CTO 2CY 2CL • MT 4217: CTO	41R3176	1
Line Cord - Australia / New Zealand • MT 4105: CTO N5M N7M P8M P9M 1EM 1LM 7CM • MT 4157: CTO J8M J9M K2M M8M M9M N7M 2CM • MT 4217: CTO	41R3196	1
Line Cord - Korea • MT 4105: CTO F8K F8R • MT 4157: CTO B5K B5R 2CK 2CR • MT 4217: CTO	41R3260	1
Line Cord - Hong Kong, UK, Ireland, Singapore, Malaysia, Brunei, Hong Kong • MT 4105: CTO L4H F8A F8H 1GB 1GH 2AG 2BG 2CG 2DG 2PH 2RH 3BH 4BH 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO C3B C3H B5A F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 2CA 2CB 2CH 3CG 3DG 5CG	41R3224	1
Line Cord - Taiwan • MT 4105: CTO F8V • MT 4157: CTO F1V C3V E6V G9V H1V H2V H3V H4V H5V H6V H7V H8V H9V M1V M2V M3V M4V M5V 2CV • MT 4217: CTO	41R3278	1
Line Cord - Italy • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CL 2CG 3CG 3DG 5CG • MT 4217: CTO	41R3232	1

Power Cords	FRU #	CRU
Line Cord - A models • MT 4105: CTO F8A • MT 4157: CTO 2CA • MT 4217: CTO	41R3208	1
Line Cord - Denmark • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG	41R3212	1
Line Cord - Switzerland • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG	41R3228	1
Line Cord - Israel • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG	41R3236	1
Line Cord - South Africa • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 7CM 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G B5A J8M J9M K2M F3G F4G F6G G6G G8G M6G M8M M9M N7M 1AG 2AG 3AG 4AG 5AG 6AG 2CG 2CM 2CA 3CG 3DG 5CG	41R3220	1
Line Cord - India • MT 4105: CTO F8Q • MT 4157: CTO B5Q 2CQ • MT 4217: CTO	41R3341	1
Line Cord - Japan and Japanese English • MT 4105: CTO 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ • MT 4157: CTO 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 2CE 2CJ • MT 4217: CTO	43N9057	1
Line Cord - US, 2P systems only • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	45J9502	1

Power Cords - Secondary	FRU #	CRU
Line Cord - US • MT 4105: CTO F8A F8T R9U R9F O1U O1F O3U O3F 1KU 1KF 2EU 2EF 2FU 2FF 3AU 3AF 5CU 5CF 6CU 6CF • MT 4157: CTO B5A B5T L9U L9F N1U N1F N2U N2F N3U N3F N4U N4F N5U N5F N6U N6F 7AU 7AF 8AU 8AF 9AU 9AF 8BU 8BF 9BU 9BF 1CU 1CF 2CU 2CF 2CS 2CL 2CD 2CA 2CT • MT 4217: CTO	41R3185	1
Line Cord - China • MT 4105: CTO K7C 1FC • MT 4157: CTO 2CC • MT 4217: CTO	41R3257	1
Line Cord - Japan and Japanese English • MT 4105: CTO 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ • MT 4157: CTO 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 2CE 2CJ • MT 4217: CTO	41R3249	1
Line Cord - Brazil (Portuguese) • MT 4105: CTO • MT 4157: CTO 2CP • MT 4217: CTO	41R3271	1
Line Cord - LA High Volt (APU) • MT 4105: CTO • MT 4157: CTO 2CY 2CL • MT 4217: CTO	41R3177	1
Line Cord - Australia / New Zealand • MT 4105: CTO N5M N7M P8M P9M 1EM 1LM 7CM • MT 4157: CTO J8M J9M K2M M8M M9M N7M 2CM • MT 4217: CTO	41R3197	1
Line Cord - Korea • MT 4105: CTO F8K F8R • MT 4157: CTO B5K B5R 2CK 2CR • MT 4217: CTO	41R3261	1
Line Cord - Hong Kong, UK, Ireland, Singapore, Malaysia, Brunei, Hong Kong • MT 4105: CTO L4H F8A F8H 1GB 1GH 2AG 2BG 2CG 2DG 2PH 2RH 3BH 4BH 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO C3B C3H B5A F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 2CA 2CB 2CH 3CG 3DG 5CG	41R3225	1
Line Cord - Taiwan • MT 4105: CTO F8V • MT 4157: CTO F1V C3V E6V G9V H1V H2V H3V H4V H5V H6V H7V H8V H9V M1V M2V M3V M4V M5V 2CV • MT 4217: CTO	41R3279	1

Power Cords - Secondary	FRU #	CRU
Line Cord - Italy • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CL 2CG 3CG 3DG 5CG • MT 4217: CTO	41R3233	1
Line Cord - A models • MT 4105: CTO F8A • MT 4157: CTO 2CA • MT 4217: CTO	41R3209	1
Line Cord - Denmark • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG	41R3213	1
Line Cord - Switzerland • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG	41R3229	1
Line Cord - Israel • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG	41R3237	1
Line Cord - South Africa • MT 4105: CTO 96G D2G M2G E6G E9G F1G F4G F5G J6G J7G K7G P1G P2G O4G O5G O6G O7G 1CG 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G B5A J8M J9M K2M F3G F4G F6G G6G G8G M6G M8M M9M N7M 1AG 2AG 3AG 4AG 5AG 6AG 2CG 2CM 2CA 3CG 3DG 5CG	41R3221	1
Line Cord - India • MT 4105: CTO F8Q • MT 4157: CTO B5Q 2CQ • MT 4217: CTO	41R3175	1
Line Cord - Japan and Japanese English • MT 4105: CTO 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ • MT 4157: CTO 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 2CE 2CJ • MT 4217: CTO	43N9058	1

Recovery discs

Windows XP Professional 64 Mono Recovery CD

Note: The Windows XP Professional recovery DVDs are available only for models with a valid Microsoft Windows XP Professional certificate of authenticity (COA) affixed to the system. Due to a Microsoft licensing

limitation, if a model came with Windows XP Professional preinstalled from the factory, but has either a Windows 7 or Windows Vista COA affixed to the system, that model is eligible only for recovery DVDs that match the operating system specified on the COA.

Windows XP Professional 64 Mono Recovery CD	FRU #	CRU
US English • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03W2822	1
Japanese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03W2823	1

Windows Vista Business 32 Recovery CD

Note: The Windows Vista recovery DVDs are available only for models with a valid Microsoft Windows Vista certificate of authenticity (COA) affixed to the system. Due to a Microsoft licensing limitation, if a model came with Windows Vista Business or Windows Vista Ultimate preinstalled from the factory, but has a Windows 7 COA affixed to the system, that model is eligible only for recovery DVDs that match the operating system specified on the COA.

Vista Bussiness 32	FRU #	CRU
English • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y5661	1
Russian English • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3672	1
French • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3673	1
German • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3674	1
Spanish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3675	1

Vista Bussiness 32	FRU #	CRU
Brazilian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3676	1
Italian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3677	1
Japanese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y5662	1
Norwegian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3699	1
Swedish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3700	1
Danish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3697	1
Dutch • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3691	1
Czech • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3678	1
Finnish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3698	1
Polish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3679	1

Vista Bussiness 32	FRU #	CRU
Russian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3680	1
Turkish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3681	1
Hungarian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3682	1
Greek • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3683	1
Simplified Chinese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y5663	1
Traditional Chinese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3686	1
Traditional Chinese - Hong Kong • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3687	1
Korean • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3688	1
Slovenian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3689	1
Romanian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3693	1

Vista Bussiness 32	FRU #	CRU
Portuguese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3694	1
Serbian-Latin • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3695	1
Slovakian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3696	1
Arabic Localized • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3690	1
Hebrew • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3692	1
C&L Nordics (EN DK FI NO SV) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3701	1
C&L Switzerland (EN FR GR IT) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3702	1
C&L Bel Lux (EN FR GR NL) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3703	1
English for India • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	71Y3620	1

Windows Vista Business 64 Recovery CD

Note: The Windows Vista recovery DVDs are available only for models with a valid Microsoft Windows Vista certificate of authenticity (COA) affixed to the system. Due to a Microsoft licensing limitation, if a model came with Windows Vista Business or Windows Vista Ultimate preinstalled from the factory, but has a Windows 7

COA affixed to the system, that model is eligible only for recovery DVDs that match the operating system specified on the COA.

Windows Vista Business 64 Recovery CD	FRU #	CRU
English • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y5664	1
Russian English • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3771	1
French • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3772	1
German • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3773	1
Spanish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3774	1
Brazilian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3775	1
Italian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3776	1
Japanese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y5665	1
Norwegian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3796	1

Windows Vista Business 64 Recovery CD	FRU #	CRU
Swedish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3797	1
Danish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3794	1
Dutch • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3790	1
Czech • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3777	1
Finnish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3795	1
Polish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3778	1
Russian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3779	1
Turkish • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3780	1
Hungarian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3781	1
Greek • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3782	1

Windows Vista Business 64 Recovery CD	FRU #	CRU
Simplified Chinese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y5666	1
Traditional Chinese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3785	1
Traditional Chinese - Hong Kong • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3786	1
Korean • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3787	1
Slovenian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3788	1
Portuguese • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3792	1
Slovakian • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3793	1
Arabic Localized • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3789	1
Hebrew • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3791	1
C&L Nordics (EN DK FI NO SV) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3798	1

Windows Vista Business 64 Recovery CD	FRU #	CRU
C&L 2 Switzerland (EN FR GR IT) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3799	1
C&L Bel Lux (EN FR GR NL) • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	64Y3800	1

Windows 7 Professional 64 SP1 Recovery CD

Windows 7 Professional 64 SP1 Recovery CD	FRU #	CRU
US English • MT 4105: CTO M2G N5M N7M L4H F8A F8Q F8H F8R J6G J7G K7G P8M P9M P1G P2G O4G O5G O6G O7G R9U O1U 1EM 1GH 1LM 1KU 2AG 2BG 2CG 2DG 2EU 2FU 2PH 2RH 3AU 3BH 3CG 4CG 5CU 6CU 7CM 8CG 9CG 4AG 4BH • MT 4157: CTO C3H B4G B5A B5Q B5R J8M J9M K2M F3G F4G F6G G6G G8G L9U M6G M8M M9M N7M N1U N2U N3U N4U N5U N6U 1AG 2AG 3AG 4AG 5AG 6AG 7AU 8AU 9AU 8BU 9BU 1CU 2CU 2CL 2CG 2CM 2CA 2CQ 2CT 2CH 2CR 2CE 3CG 3DG 5CG • MT 4217: CTO	03W2908	1
French • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G R9F O1F O3F 1KF 2AG 2BG 2CG 2DG 2EF 2FF 3AF 5CF 6CF 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO F3G F4G F6G G6G G8G L9F M6G N1F N2F N3F N4F N5F N6F 1AG 2AG 3AG 4AG 5AG 6AG 7AF 8AF 9AF 8BF 9BF 1CF 2CF 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2890	1
German • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2892	1
Czech • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2888	1

Windows 7 Professional 64 SP1 Recovery CD	FRU #	CRU
Polish • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2898	1
Turkish • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2907	1
Greek • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2891	1
Korean • MT 4105: CTO F8K • MT 4157: CTO 2CK • MT 4217: CTO	03W2897	1
Slovenian • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2904	1
Russian English • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2900	1
Slovakian • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2903	1

Windows 7 Professional 64 SP1 Recovery CD	FRU #	CRU
Arabic Localized • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2884	1
Simplified Chinese • MT 4105: CTO K7C 1FC • MT 4157: CTO 2CC • MT 4217: CTO	03W2886	1
Traditional Chinese • MT 4105: CTO F8V 1GB • MT 4157: CTO C3B C3H 2CB 2CV • MT 4217: CTO	03W2887	1
India English • MT 4105: CTO • MT 4157: CTO 2CQ • MT 4217: CTO	03W2889	1
Hong Kong • MT 4105: CTO • MT 4157: CTO E6B G9B H1B H2B H3B H4B H5B H6B H7B H8B H9B M1B M2B M3B M4B M5B 2CB • MT 4217: CTO	03W2893	1
Italian • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2895	1
Russian • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2902	1
Spanish • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2905	1

Windows 7 Professional 64 SP1 Recovery CD	FRU #	CRU
C&L Bel Lux (EN FR GR NL) • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2909	1
C&L Nordics (EN DK FI NO SV) • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2910	1
C&L Switzerland (EN FR GR IT) • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2911	1
Portuguese • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG	03W2899	1
Brazilian Portuguese • MT 4105: CTO • MT 4157: 2CP • MT 4217: CTO	03W2885	1
Hungary • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2894	1
Romanian • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2901	1

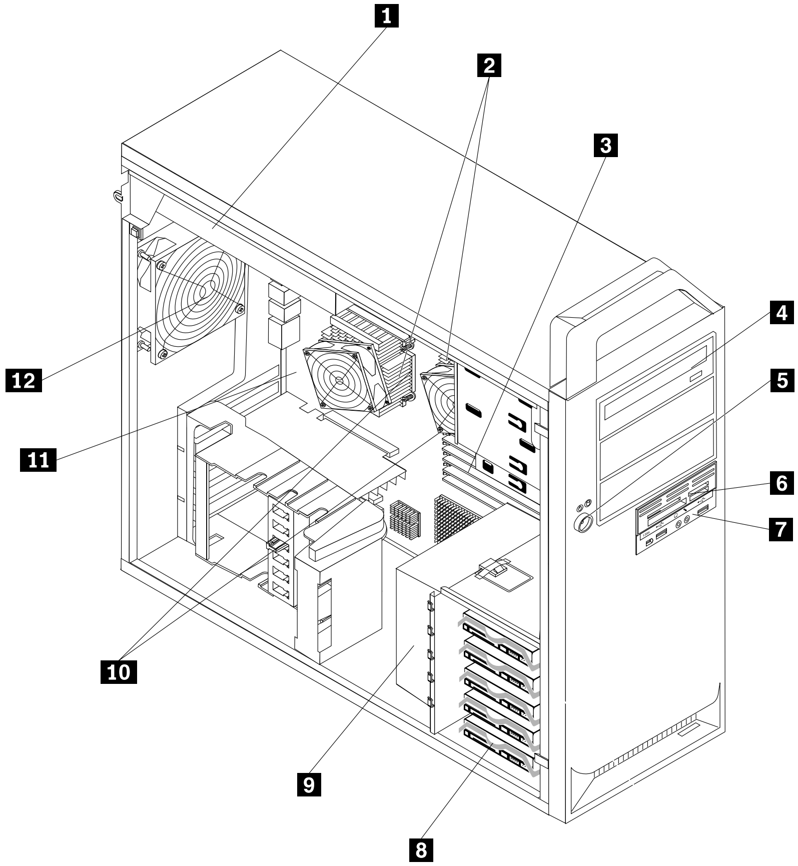
Windows 7 Professional 64 SP1 Recovery CD	FRU #	CRU
Serbian-Latin • MT 4105: CTO 96G D2G M2G J6G J7G K7G P1G P2G O4G O5G O6G O7G 2AG 2BG 2CG 2DG 3CG 4CG 8CG 9CG 4AG • MT 4157: CTO B4G F3G F4G F6G G6G G8G M6G 1AG 2AG 3AG 4AG 5AG 6AG 2CG 3CG 3DG 5CG • MT 4217: CTO	03W2906	1
Japanese • MT 4105: CTO 2GJ 2HJ 2JJ 2KJ 2LJ 2MJ 2NJ 2OJ • MT 4157: CTO 1BJ 2BJ 3BJ 4BJ 5BJ 6BJ 7BJ 2CJ • MT 4217: CTO	03W2896	1

Windows 7 Ultimate 64 SP1 Recovery CD

Windows 7 Ultimate 64 SP1 Recovery CD	FRU #	CRU
US English • MT 4105: CTO • MT 4157: CTO • MT 4217: CTO	03W2883	1

Overall: MT 4155, 4158, and 4218

The following replaceable components are available for the 4155, 4158, and 4218 machine type models.



Item#	FRUs	FRU #	CRU
1	Power supply, 1060 Watt power supply • MT 4155: CTO D1G D4G E7M E1U E1F D7C A4H A4V 93G 88G 89G 99A 99Q 99T 99K 99R A2A A2Q A2T F3J F9C E9U E9F F1U F1F G2M G3G G4G G5G G7U G7F G8U G8F G9M H1M H2M H3J H4J H5J H6J H7J H8J H9U H9F J1J J2J J3J J4J J5J J6J J7J J8J K1G K2G K3G K4U K4F K5M K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E F3M F4M F6M C2G C3G C5G C7G C8G D2G C6C F9U F9F G7U G7F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M6J M7J M8J M9J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N4U N4F N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A9761	2
2	Fan, memory cooling • MT 4155: all models • MT 4158: all models • MT 4218: all models	45J9607	2

Item#	FRUs	FRU #	CRU
2	Heat sink - performance microprocessors (80W/95W) • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5578	2
2	Heat sink - workstation microprocessors (130W) • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5580	2
3	Memory module, 1GB DDR3 ECC UDIMM PC3-10600 (1333MHz) • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6026	1
3	Memory module, 2GB DDR3 ECC UDIMM PC3-10600 (1333MHz) • MT 4155: CTO D1G D4G E7M E1U E1F D7C 88G A2A A2Q A2T F9C E9U E9F F1U F1F G2M G3G G4G G5G G7U G7F G8U G8F G9M H1M H9U H9F J4J J5J J6J K1G K2G K3G K4U K4F K5M K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E F3M F4M F6M C2G C3G C5G C7G C8G D2G C6C F9U F9F G7U G7F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M6J M7J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N4U N4F N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	46R6027	1
3	Memory module, 4GB DDR3 ECC UDIMM (9-9-9) PC3-10600 (1333MHz) • MT 4155: CTO J1J J2J J3J J7J J8J J9H • MT 4158: CTO M5J M8J M9J • MT 4218:	64Y9570	1
3	Memory module, 1GB DDR3 1RX8 RDIMM PC3-8500 (1066MHz) • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6022	1
3	Memory module, 2GB DDR3 2RX8 RDIMM PC3-8500 (1066MHz) • MT 4155: CTO A4H A4V • MT 4158: CTO • MT 4218:	46R6023	1

Item#	FRUs	FRU #	CRU
3	Memory module, 4GB DDR3 2RX4 RDIMM PC3-8500 (1066MHz) • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6024	1
3	Memory module, 8GB DDR3 4RX4 RDIMM PC3-8500 (1066MHz) • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6025	1
3	Memory module, 1GB DDR3 ECC UDIMM PC3-8500 (1066MHz) • MT 4155: CTO • MT 4158: CTO • MT 4218:	53Y6195	1
3	Memory module, 2GB DDR3 ECC UDIMM PC3-8500 (1066MHz) • MT 4155: CTO 93G 89G • MT 4158: CTO • MT 4218:	53Y6197	1
3	Memory module, 1GB DDR3 1RX8 RDIMM x 72 PC3-10600R (1333MHz) • MT 4155: CTO • MT 4158: CTO • MT 4218:	89Y1289	1
3	Memory module, 2GB DDR3 2RX8 RDIMM x 72 PC3-10600R (1333MHz) • MT 4155: CTO K5M K6G K7G • MT 4158: CTO N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	89Y1290	1
3	Memory module, 4GB DDR3 2RX4 RDIMM x 72 PC3-10600R (1333MHz) • MT 4155: CTO • MT 4158: CTO • MT 4218:	89Y1291	1
3	Memory module, 8GB DDR3 2RX4 RDIMM x 72 PC3-10600R (1333MHz) • MT 4155: CTO • MT 4158: CTO • MT 4218:	89Y1292	1
3	Memory module, 16GB DDR3 4RX4 RDIMM PC3-8500R (1066MHz) • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03T8037	1

Item#	FRUs	FRU #	CRU
3	Memory module, 8GB DDR3 ECC UDIMM (9-9-9) PC3-10600 (1333MHz) • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03T8429	1
4	Optical drive, DVD-ROM drive - 16x/48x (SATA) - DOS/Linux • MT 4155: CTO • MT 4158: CTO M6J • MT 4218:	41N3325	1
4	Optical drive, DVD-ROM drive - 16x/48x (SATA) - DOS/Linux • MT 4155: CTO • MT 4158: CTO M6J • MT 4218:	71Y5543	1
4	Optical drive, DVD burner/CD-RW rambo 8 (SATA) - DOS/Linux • MT 4155: CTO D1G D4G E1U E1F D7C A4H A4V 93G 88G 89G A2A A2Q A2T F9C E9U E9F F1U F1F G2M G3G G4G G5G G7U G7F G8U G8F G9M H1M H2M H9U H9F J1J J2J J3J J4J J5J J6J J7J J8J J9H K1G K2G K3G K4U K4F K5M K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E F3M F4M F6M C2G C3G C5G C7G C8G D2G F9U F9F G7U G7F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M7J M8J M9J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N4U N4F N5U N5F N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	43C1042	1
4	Optical drive, DVD burner/CD-RW rambo 8 (SATA) - DOS/Linux • MT 4155: CTO D1G D4G E1U E1F D7C A4H A4V 93G 88G 89G A2A A2Q A2T F9C E9U E9F F1U F1F G2M G3G G4G G5G G7U G7F G8U G8F G9M H1M H2M H9U H9F J1J J2J J3J J4J J5J J6J J7J J8J J9H K1G K2G K3G K4U K4F K5M K6G K7G • MT 4158: CTO • MT 4218: CTO	71Y5545	1
4	Optical drive, Blu-Ray with AACS bus encryption • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03T8423	1
5	Power switch, speaker, LED, and bracket assembly • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5532	2

Item#	FRUs	FRU #	CRU
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD • MT 4155: CTO • MT 4158: CTO • MT 4218:	40Y9105	1
6	Diskette drive, 3.5" 1.44MB 2-Mode FDD • MT 4155: CTO • MT 4158: CTO • MT 4218:	40Y9107	1
7	FRU, front panel cable assembly (USB, audio, 1394), Remy • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5657	2
8	Hard disk drive, 250GB SATA - 7200 rpm, 8MB cache, 3.5" • MT 4155: CTO J4J • MT 4158: CTO • MT 4218: CTO	46R6029	1
8	Hard disk drive, 500GB SATA - 7200 rpm, 3 Gb/s, 16MB cache, 3.5" • MT 4155: CTO D4G E7M E1U E1F 93G E9U E9F F1U F1F G2M G3G G4G G5G G7U G7F G8U G8F G9M H9U H9F J2J J3J J5J J7J J8J K4U K4F K5M K6G K7G • MT 4158: CTO F4M F6M C2G C3G C5G D2G F9U F9F H5M H6M H8G H9G J2U J2F J7U J7F J9U J9F K3M M3U M3F M4U M4F M5J M6J M8J M9J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	46R6030	1
8	Hard disk drive, 750GB SATA - 7200 rpm, 3 Gb/s, 16MB cache, 3.5" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	43C3671	1
8	Hard disk drive, 1TB SATA - 7200 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4155: CTO H2M J9H K2G K3G • MT 4158: CTO K2M K4M K6M L5G L6G L7G L8G L9G M1G M2G • MT 4218: CTO	46R6031	1
8	Hard disk drive, 74GB SATA - 10000 rpm, 3 Gb/s, 16MB cache, 2.5" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	46R6032	2
8	Hard disk drive, 150GB SATA - 10000 rpm, 3 Gb/s, 16MB cache, 2.5" • MT 4155: CTO 88G • MT 4158: CTO • MT 4218: CTO	46R6400	2

Item#	FRUs	FRU #	CRU
8	Hard disk drive, 300GB SATA - 10000 rpm, 3 Gb/s, 16MB cache, 2.5" • MT 4155: CTO • MT 4158: CTO J1G J3U J3F J4U J4F • MT 4218: CTO	46R6401	2
8	Hard disk drive, 147GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	46R6033	1
8	Hard disk drive, 147GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	45K0608	1
8	Hard disk drive, 300GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4155: CTO D1G D7C A4H A4V A2A A2Q A2T F9C G9M H1M H2M H1M • MT 4158: CTO F3M C7G J5U J5F J6U J6F J8U J8F K1U K1F K5M K7M • MT 4218:	43C6969	1
8	Hard disk drive, 300GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4155: CTO D1G D7C A4H A4V A2A A2Q A2T F9C G9M H1M H2M H1M • MT 4158: CTO F3M C7G C6C J5U J5F J6U J6F J8U J8F K1U K1F K5M K7M • MT 4218:	45K0609	1
8	Hard disk drive, 300GB SAS - 15000 rpm, 6 Gb/s, 32MB cache, 3.5" • MT 4155: CTO D1G D7C A4H A4V A2A A2Q A2T F9C G9M H1M H2M H1M • MT 4158: CTO F3M C7G C6C J5U J5F J6U J6F J8U J8F K1U K1F K5M K7M • MT 4218:	03X3621	1
8	Hard disk drive, 450GB SAS - 15000 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4155: CTO • MT 4158: CTO M7J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N4U N4F • MT 4218: CTO	45J4899	1
8	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	45N7953	1
8	Hard disk drive, 128GB SATA Solid State Drive (SSD) - MLC, 1.8" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	45N8203	1

Item#	FRUs	FRU #	CRU
8	Hard disk drive, 256GB SATA Solid State Drive (SSD) - MLC, 1.8" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	45N7959	1
8	Hard disk drive, 256GB SATA Solid State Drive (SSD) - MLC, 1.8" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	45N8207	1
8	Hard disk drive, 160GB SATA Solid State Drive (SSD) - MLC, 1.8" • MT 4155: CTO • MT 4158: CTO	45N7963	1
8	Hard disk drive, 160GB SATA Solid State Drive (SSD) - MLC, 1.8" • MT 4155: CTO • MT 4158: CTO	45N8019	1
8	Hard disk drive, 2TB SATA - 7200 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4155: CTO K1G • MT 4158: CTO • MT 4218: CTO	45K0610	1
8	Hard disk drive, 1TB SATA - 7200 rpm, 3 Gb/s, 32MB cache, 3.5" • MT 4155: CTO H2M J9H K2G K3G • MT 4158: CTO K2M K4M K6M L5G L6G L7G L8G L9G M1G M2G • MT 4218: CTO	45K0412	1
8	Hard disk drive, 128GB SATA Solid State Drive (SSD), 2.5" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	45K0617	1
8	Hard disk drive, 256GB SATA Solid State Drive (SSD), 2.5" • MT 4155: CTO • MT 4158: CTO K8M • MT 4218: CTO	45K0618	1
8	Hard disk drive, 160GB SATA Solid State Drive (SSD) - MLC-SM160, 2.5" • MT 4155: CTO J1J J6J • MT 4158: CTO • MT 4218: CTO	45K0616	1
8	Hard disk drive, 160GB SATA Solid State Drive (SSD) - MLC-SM160, 2.5" • MT 4155: CTO J1J J6J • MT 4158: CTO • MT 4218: CTO	03T7026	1

Item#	FRUs	FRU #	CRU
8	Hard disk drive, 600GB SATA - 10000 rpm, 16MB cache, 2.5" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	91Y1658	1
8	Hard disk drive, 600GB SAS - 15000 rpm, 3.5" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03X3616	1
8	Hard disk drive, 600GB SAS - 15000 rpm, 3.5" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03X3623	1
8	Hard disk drive, 250GB SATA - 7200 rpm, 3.5" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03T7039	1
8	Hard disk drive, 500GB SATA - 7200 rpm, 3.5" • MT 4155: CTO K5M K6G K7G • MT 4158: CTO N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218: CTO	03T7041	1
8	Hard disk drive, 1TB SATA - 7200 rpm, 3.5" • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03T7042	1
9	Front fan, 120 mm (HDD/PCI) with grommets • MT 4155: all models • MT 4158: all models • MT 4218: all models	45J9606	2
10	Microprocessor, Intel Xeon E5502 - 1.86GHz, Dual Core 4.8 QPI, 4MB L2, DDR3-800, 80W • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6630	N
10	Microprocessor, Intel Xeon E5503 - Dual Core - 2.00GHz - 4.8 QPI DDR3-800-4MB 80W • MT 4155: CTO • MT 4158: CTO • MT 4218:	71Y9029	N

Item#	FRUs	FRU #	CRU
10	Microprocessor, Intel Xeon E5504 - 2.00GHz, Quad Core- 4.8QPI, 4MB L2, DDR3-800, 80W • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6631	N
10	Microprocessor, Intel Xeon E5506 - 2.13GHz, Quad Core - 4.8QPI, 4MB L2, DDR3-800, 80W • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6632	N
10	Microprocessor, Intel Xeon E5507 - Quad Core - 2.26GHz - 4.8 QPI DDR3-800-4MB 80W • MT 4155: CTO • MT 4158: CTO • MT 4218:	71Y9031	N
10	Microprocessor, Intel Xeon E5520 - 2.26GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6633	N
10	Microprocessor, IIntel Xeon E5530 - 2.40GHz, Quad Core - 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6634	N
10	Microprocessor, Intel Xeon E5540 - 2.53GHz, Quad Core 5.86 QPI, 8MB L2, DDR3-1066, Turbo, SMT, 80W • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6635	N
10	Microprocessor, Intel Xeon E5620 - Quad Core - 2.40GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W • MT 4155: CTO D1G D4G E1U E1F A4H A4V 93G 89G E9U E9F G2M K3G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E F9U F9F G7U G7F H1U H1F K2M K3M N6M • MT 4218:	71Y9049	N
10	Microprocessor, Intel Xeon E5630 - Quad Core - 2.53GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W • MT 4155: • MT 4158: CTO • MT 4218:	71Y9047	N

Item#	FRUs	FRU #	CRU
10	Microprocessor, Intel Xeon E5640 - Quad Core - 2.66GHz - 5.86 QPI DDR3-1066-12MB Turbo SMT 80W • MT 4155: • MT 4158: CTO • MT 4218:	71Y9045	N
10	Microprocessor, Intel Xeon X5550 - 2.66GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W • MT 4155: CTO • MT 4158: CTO F3M F4M K6M • MT 4218:	46R6638	N
10	Microprocessor, Intel Xeon X5560 - 2.80GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W • MT 4155: CTO 88G • MT 4158: CTO • MT 4218:	46R6639	N
10	Microprocessor, Intel Xeon X5650 - 6 Core - 2.66GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W • MT 4155: D7C A2A A2Q A2T F9C F1U F1F H1M K4U K4F • MT 4158: CTO C2G D2G C6C H5M H6M M3U M3F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N5U N5F N8M • MT 4218:	71Y9043	N
10	Microprocessor, Intel Xeon X5660 - 6 Core - 2.80GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W • MT 4155: CTO • MT 4158: CTO H1U H1F M5J N2U N2F N4U N4F • MT 4218:	71Y9041	N
10	Microprocessor, Intel Xeon X5667 - Quad Core - 3.06GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W • MT 4155: CTO • MT 4158: CTO • MT 4218:	71Y9039	N
10	Microprocessor, Intel Xeon X5570 - 2.93GHz, Quad Core - 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 95W • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6640	N
10	Microprocessor, Intel Xeon X5680 - 6 Cores - 3.33GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W • MT 4155: CTO • MT 4158: CTO • MT 4218:	71Y9033	N

Item#	FRUs	FRU #	CRU
10	Microprocessor, Intel Xeon X5677 - Quad Core - 3.46GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 130W • MT 4155: CTO • MT 4158: CTO • MT 4218:	71Y9035	N
10	Microprocessor, Intel Xeon X5670 - 6 Core - 2.93GHz - 6.4 QPI DDR3-1333-12MB Turbo SMT 95W • MT 4155: • MT 4158: CTO • MT 4218:	71Y9037	N
10	Microprocessor, Intel Xeon W5580 - 3.20GHz, Quad Core 6.4 QPI, 8MB L2, DDR3-1333, Turbo, SMT, 130W • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6641	N
10	Microprocessor, Intel Xeon W5590 - Quad Core - 3.33GHZ - 6.4 QPI, 8MB Cache, DDR3 - 1333, Turbo, HT, 130W • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y9831	N
10	Microprocessor, Intel Xeon E5603 - Quad Core - 1.6Ghz - 4.8 QPI, 4MB Cache, DDR3 - 1066, No HT, No Turbo, 80W • MT 4155: CTO H9U H9F • MT 4158: CTO J2U J2F M4U M4F • MT 4218: CTO	03T8032	N
10	Microprocessor, Intel Xeon E5606 - Quad Core - 2.13Ghz - 4.8 QPI, 8MB Cache, DDR3 - 1066, No HT, No Turbo, 80W • MT 4155: CTO G4G • MT 4158: CTO • MT 4218: CTO	03T8031	N
10	Microprocessor, Intel Xeon E5607 - Quad Core - 2.26Ghz - 4.8 QPI, 8MB Cache, DDR3 - 1066, No HT, No Turbo, 80W • MT 4155: CTO G3G G7U G7F K2G K6G • MT 4158: CTO J6U J6F • MT 4218: CTO	03T8030	N
10	Microprocessor, Intel Xeon E5645 - 6 Core - 2.4Ghz - 5.86 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 80W • MT 4155: CTO G5G G8U G8F J4J J5J K1G • MT 4158: CTO H8G J7U J7F L5G L9G M6J N9G O4G • MT 4218: CTO	03T8029	N

Item#	FRUs	FRU #	CRU
10	Microprocessor, Intel Xeon E5649 - 6 Core - 2.53Ghz - 5.86 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 80W • MT 4155: CTO G9M • MT 4158: CTO H9G K4M K5M L6G N7M O1G • MT 4218: CTO	03T8027	N
10	Microprocessor, Intel Xeon X5647 - Quad Core - 2.93Ghz - 5.86 QPI, 12MB Cache, DDR3 - 1066, Turbo, HT, 130W • MT 4155: CTO • MT 4158: CTO J3U J3F J5U J5F J8U J8F J9U J9F L7G O2G • MT 4218: CTO	03T8028	N
10	Microprocessor, Intel Xeon X5672 - Quad Core - 3.2Ghz - 6.4 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 95W • MT 4155: CTO • MT 4158: CTO M2G O6G • MT 4218: CTO	03T8026	N
10	Microprocessor, Intel Xeon X5675 - 6 Core - 3.06Ghz - 6.4 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 95W • MT 4155: CTO H2M J1J J2J J3J J6J J9H K5M • MT 4158: CTO M7J M9J • MT 4218: CTO	03T8025	N
10	Microprocessor, Intel Xeon X5687 - Quad Core - 3.6Ghz - 6.4 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 130W • MT 4155: CTO • MT 4158: CTO J1G J4U J4F M1G N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J O5G • MT 4218: CTO	03T8024	N
10	Microprocessor, Intel Xeon X5690 - 6 Core - 3.46Ghz - 6.4 QPI, 12MB Cache, DDR3 - 1333, Turbo, HT, 130W • MT 4155: CTO J7J J8J • MT 4158: CTO K1U K1F K7M K8M L8G M8J O3G • MT 4218: CTO	03T8023	N
10	Microprocessor, Intel Xeon L5630 - Quad Core - 2.13GHz - 5.86 QPI, 12MB Cache, DDR3-1066, Turbo, HT, 40W • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03T8045	N

Item#	FRUs	FRU #	CRU
11	System board, Ibiza - 2P Intel LGA 1366, Tylersburg 36D, ICH10 (GA level v1.7, TPM enabled) • MT 4155: CTO D1G D4G E7M E1U E1F D7C A4H A4V 93G 88G 89G 91G A2A A2Q A2T F9C E9U E9F F1U F1F G2M G3G G4G G5G G7U G7F G8U G8F G9M H1M H2M H9U H9F J1J J2J J3J J4J J5J J6J J7J J8J J9H K1G K2G K3G K4U K4F K5M K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E F3M F4M F6M C2G C3G C5G C7G C8G D2G C6C F9U F9F G7U G7F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M6J M7J M8J M9J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N4U N4F N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	71Y8826	N
11	System board, Ibiza - 2P Intel LGA 1366, Tylersburg 36D, ICH10 (GA Level v1.7, TPM disabled) • MT 4155: D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: D6G C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	71Y8828	N
11	System board, Ibiza - 2P Intel LGA 1366, Tylersburg 36D, ICH10 (TPM enabled) • MT 4155: CTO D1G D4G E7M E1U E1F D7C A4H A4V 93G 88G 89G A2A A2Q A2T F9C E9U E9F F1U F1F G2M G3G G4G G5G G7U G7F G8U G8F G9M H1M H2M H9U H9F J1J J2J J3J J4J J5J J6J J7J J8J J9H K1G K2G K3G K4U K4F K5M K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E F3M F4M F6M C2G C3G C5G C7G C8G D2G C6C F9U F9F G7U G7F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M6J M7J M8J M9J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N4U N4F N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	03T8043	N
11	System board, Ibiza - 2P Intel LGA 1366, Tylersburg 36D, ICH10 (TPM disabled) • MT 4155: D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: D6G C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	03T8044	N

Item#	FRUs	FRU #	CRU
11	System board, Ibiza - 2P Intel LGA 1366, Tylersburg 36D, ICH10 (Change 5V USB resistors + Marvell 3.1.0.21 FW) • MT 4155: J1J J2J J3J J4J J5J J6J J7J J8J J9H K1G K2G K3G K4U K4F K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E F3M F4M F6M C2G C3G C5G C7G C8G D2G C6C F9U F9F G7U G7F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M6J M7J M8J M9J N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	46R4545	N
11	System board, Ibiza - 2P Intel LGA 1366, Tylersburg 36D, ICH10 (Russia only Planar) TPM disabled • MT 4155: D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E F3M F4M F6M C2G C3G C5G C7G C8G D2G C6C F9U F9F G7U G7F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M6J M7J M8J M9J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N4U N4F N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	64Y6338	N
11	System board, Ibiza - 2P Intel LGA 1366, Tylersburg 36D, ICH10 (capacitor update for shutdown issue) • MT 4155: J1J J2J J3J J4J J5J J6J J7J J8J J9H K1G K2G K3G K4U K4F K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E F3M F4M F6M C2G C3G C5G C7G C8G D2G F9U F9F G7U G7F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M6J M7J M8J M9J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N4U N4F N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	71Y7060	N

Item#	FRUs	FRU #	CRU
11	System board, Ibiza - 2P Intel LGA 1366, Tylersburg 36D, ICH10 (PCI 2.3 compliance rework) • MT 4155: J1J J2J J3J J4J J5J J6J J7J J8J J9H K1G K2G K3G K4U K4F K6G K7G • MT 4158: D6G C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	64Y9118	N
11	System board, Ibiza - 2P Intel LGA 1366, Tylersburg 36D, ICH10 (TPM disabled/original IOH heat sink) • MT 4155: D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E C2G C3G C5G C7G C8G D2G C6C F9U F9F G7U G7F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M6J M7J M8J M9J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N4U N4F N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	64Y9121	N
11	System board, Ibiza - 2P Intel LGA 1366, Tylersburg 36D, ICH10 (Embedded PCI 2.3 compliance rework) • MT 4155: J1J J2J J3J J4J J5J J6J J7J J8J J9H K1G K2G K3G K4U K4F K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E C2G C3G C5G C7G C8G D2G C6C F9U F9F G7U G7F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M6J M7J M8J M9J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N4U N4F N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	71Y4934	N
11	System board, Ibiza - 2P Intel LGA 1366, Tylersburg 36D, ICH10 (PCB V1.4 TPM enabled) • MT 4155: CTO D1G D4G E7M E1U E1F D7C J1J J2J J3J J4J J5J J6J J7J J8J J9H K1G K2G K3G K4U K4F K5M K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E C2G C3G C5G C7G C8G D2G C6C F9U F9F G7U G7F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M6J M7J M8J M9J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V	71Y7061	N

Item#	FRUs	FRU #	CRU
	N3K N3R N3E N3J N4U N4F N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:		
12	Rear fan, 120 mm system exhaust • MT 4155: all models • MT 4158: all models • MT 4218: all models	45J9605	2

Mechanical FRUs

The FRUs listed in the following tables are not illustrated.

FRUs	FRU #	CRU
FRU, FDD cable • MT 4155: all models • MT 4158: all models • MT 4218: all models	41N8294	2
FRU, handle with screws • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5526	1
FRU, miscellaneous parts kit • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5630	2
FRU, thermal sense cable • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R2511	2
FRU, system board screw kit • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5547	2
FRU, rail kit, Remy with filler • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5597	2
FRU, filler plate, Remy • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5636	1

FRUs	FRU #	CRU
FRU, cover assembly (access panel), Remy • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5654	1
FRU, label kit, Remy • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5656	1
FRU, mechanical shell kit, Remy • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5658	N
FRU, system board_shield • MT 4155: all models • MT 4158: all models • MT 4218: all models	45K2256	2
FRU, cable, SATA hard disk drive • MT 4155: all models • MT 4158: all models • MT 4218: all models	26K1186	2
FRU, 1.8 SSD to 3.5 hard disk drive conversion kit with PCB • MT 4155: all models • MT 4158: all models • MT 4218: all models	43N9593	2
FRU, memory chiller assembly • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5655	2
FRU, bezel kit • MT 4155: all models • MT 4158: all models • MT 4218: all models	45K2268	2
FRU, cable, signal, SLI bridge • MT 4155: all models • MT 4158: all models • MT 4218: all models	63Y9163	2
Enhanced card and bracket assembly • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5694	2

FRUs	FRU #	CRU
Enhanced cable assembly • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5604	2
Heat sink RM bracket • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5592	2
2.5" hard disk drive mounting kit (fits into existing hard disk drive caddy) • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5625	2
FRU, miscellaneous parts kit • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5628	2
FRU, second serial port cable • MT 4155: all models • MT 4158: all models • MT 4218: all models	41R5544	2

Keyboard and Mouse

Keyboard - Preferred Pro Full size	FRU #	CRU
US English • MT 4155: CTO D1G D4G E7M E1U A4H A4V 93G 88G 89G A2A A2Q E9U F1U G1U G2M G6U G7U G8U G9M H1M H2M H9U J9H K1G K2G K3G K4U K5M • MT 4158: CTO D6U D6L D6G D6M D6A D6Q D6H D6R D6E F3M F4M F6M C2G C3G D2G F9U G7U H1U H5M H6M J2U J3U J4U J5U J6U J7U J8U J9U K1U K2M K3M K4M K5M K6M K7M K8M M3U M4U N1U N2U N3U N4U N1L N3L N1M N3M N1A N3A N1Q N3Q N1H N3H N1R N3R N1E N3E N5U N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5289	1
Arabic • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5290	1
Arabic/French • MT 4155: CTO • MT 4158: CTO • MT 4218:	41A5291	1

Keyboard - Preferred Pro Full size	FRU #	CRU
Belgian/French • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5292	1
Belgian/UK • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5293	1
Brazilian • MT 4155: CTO • MT 4158: CTO • MT 4218:	41A5294	1
Bulgarian • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5295	1
Hong Kong/Taiwan • MT 4155: CTO • MT 4158: D6C D6B D6V N1B N3B N1V N3V • MT 4218:	41A5296	1
Czech • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5297	1
Danish • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5298	1
Dutch • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5299	1
French • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5300	1

Keyboard - Preferred Pro Full size	FRU #	CRU
French Canadian • MT 4155: CTO E1F E9F F1F G7F G8F H9F K4F • MT 4158: CTO D6F F9F G7F H1F J2F J3F J4F J5F J6F J7F J8F J9F K1F M3F M4F N1F N2F N3F N4F N5F	41A5301	1
French Canadian • MT 4155: CTO E1F E9F F1F G7F G8F H9F K4F • MT 4158: CTO D6F F9F G7F H1F J2F J3F J4F J5F J6F J7F J8F J9F K1F M3FM4F N1F N2F N3F N4F N5F • MT 4218:	41A5302	1
German • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5303	1
Greek • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5304	1
Greek/US • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5305	1
Hebrew • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5306	1
Hungarian • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5307	1
Iceland • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5308	1

Keyboard - Preferred Pro Full size	FRU #	CRU
Italy • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5309	1
Japanese • MT 4155: CTO J1J J2J J3J J4J J5J J6J J7J J8J • MT 4158: CTO M5J M6J M7J M8J M9J N1J N3J • MT 4218:	41A5310	1
Korean • MT 4155: CTO • MT 4158: CTO D6K N1K N3K • MT 4218:	41A5311	1
LA Spanish • MT 4155: CTO • MT 4158: CTO D6S D6D D6Y N1S N3S N1D N3D N1Y N3Y • MT 4218:	41A5312	1
Norwegian • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5313	1
Polish • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5314	1
Portuguese • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5315	1
Romanian • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5317	1
Romanian • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5316	1

Keyboard - Preferred Pro Full size	FRU #	CRU
Russian/Cyrillic • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5318	1
Serbian/Cyrillic • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5319	1
Slovak • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5320	1
Spanish • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5321	1
Swedish/Finnish • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5322	1
Swiss French/German • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5323	1
Thailand • MT 4155: A2T • MT 4158: CTO D6T N1T N3T • MT 4218:	41A5324	1
Turkish • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5325	1

Keyboard - Preferred Pro Full size	FRU #	CRU
Turkish • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5326	1
UK English • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5327	1
US European • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5328	1
Slovenian • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41A5329	1

Keyboard - Full Size PS/2	FRU #	CRU
US English • MT 4155: • MT 4158: • MT 4218:	41A5039	1
Arabic • MT 4155: • MT 4158: • MT 4218:	41A5040	1
Arabic/French • MT 4155: • MT 4158: • MT 4218:	41A5041	1
Belgian/French • MT 4155: • MT 4158: • MT 4218:	41A5042	1
Belgian/UK • MT 4155: • MT 4158: • MT 4218:	41A5043	1

Keyboard - Full Size PS/2	FRU #	CRU
Brazilian • MT 4155: • MT 4158: • MT 4218:	41A5044	1
Bulgarian • MT 4155: • MT 4158: • MT 4218:	41A5045	1
Hong Kong/Taiwan • MT 4155: • MT 4158: • MT 4218:	41A5046	1
Czech • MT 4155: • MT 4158: • MT 4218:	41A5047	1
Danish • MT 4155: • MT 4158: • MT 4218:	41A5048	1
Dutch • MT 4155: • MT 4158: • MT 4218:	41A5049	1
French • MT 4155: • MT 4158: • MT 4218:	41A5050	1
French Canadian • MT 4155: • MT 4158: • MT 4218:	41A5051	1
French Canadian • MT 4155: • MT 4158: • MT 4218:	41A5052	1
German • MT 4155: • MT 4158: • MT 4218:	41A5053	1

Keyboard - Full Size PS/2	FRU #	CRU
Greek • MT 4155: • MT 4158: • MT 4218:	41A5054	1
Greek/US • MT 4155: • MT 4158: • MT 4218:	41A5080	1
Hebrew • MT 4155: • MT 4158: • MT 4218:	41A5055	1
Hungarian • MT 4155: • MT 4158: • MT 4218:	41A5056	1
Iceland • MT 4155: • MT 4158: • MT 4218:	41A5057	1
Italy • MT 4155: • MT 4158: • MT 4218:	41A5058	1
Japanese • MT 4155: • MT 4158: • MT 4218:	41A5059	1
Korean • MT 4155: • MT 4158: • MT 4218:	41A5060	1
LA Spanish • MT 4155: • MT 4158: • MT 4218:	41A5061	1
Norwegian • MT 4155: • MT 4158: • MT 4218:	41A5062	1

Keyboard - Full Size PS/2	FRU #	CRU
Polish • MT 4155: • MT 4158: • MT 4218:	41A5063	1
Portuguese • MT 4155: • MT 4158: • MT 4218:	41A5064	1
Romanian • MT 4155: • MT 4158: • MT 4218:	41A5065	1
Russian/Cyrillic • MT 4155: • MT 4158: • MT 4218:	41A5066	1
Serbian/Cyrillic • MT 4155: • MT 4158: • MT 4218:	41A5067	1
Slovak • MT 4155: • MT 4158: • MT 4218:	41A5068	1
Spanish • MT 4155: • MT 4158: • MT 4218:	41A5069	1
Swedish/Finnish • MT 4155: • MT 4158: • MT 4218:	41A5070	1
Swiss French/German • MT 4155: • MT 4158: • MT 4218:	41A5071	1
Thailand • MT 4155: • MT 4158: • MT 4218:	41A5072	1

Keyboard - Full Size PS/2	FRU #	CRU
Turkish • MT 4155: • MT 4158: • MT 4218:	41A5073	1
Turkish • MT 4155: • MT 4158: • MT 4218:	41A5074	1
UK English • MT 4155: • MT 4158: • MT 4218:	41A5075	1
US European • MT 4155: • MT 4158: • MT 4218:	41A5076	1
Slovenian • MT 4155: • MT 4158: • MT 4218:	41A5077	1

Keyboard - Enhanced Performance	FRU #	CRU
US English • MT 4155: • MT 4158: • MT 4218:	41A4961	1
Arabic • MT 4155: • MT 4158: • MT 4218:	41A4962	1
Arabic/French • MT 4155: • MT 4158: • MT 4218:	41A4963	1
Belgian/French • MT 4155: • MT 4158: • MT 4218:	41A4964	1

Keyboard - Enhanced Performance	FRU #	CRU
Belgian/UK • MT 4155: • MT 4158: • MT 4218:	41A4965	1
Brazilian • MT 4155: • MT 4158: • MT 4218:	41A4966	1
Bulgarian • MT 4155: • MT 4158: • MT 4218:	41A4967	1
Hong Kong/Taiwan • MT 4155: • MT 4158: • MT 4218:	41A4968	1
Czech • MT 4155: • MT 4158: • MT 4218:	41A4969	1
Danish • MT 4155: • MT 4158: • MT 4218:	41A4970	1
Dutch • MT 4155: • MT 4158: • MT 4218:	41A4971	1
French • MT 4155: • MT 4158: • MT 4218:	41A4972	1
French Canadian • MT 4155: • MT 4158: • MT 4218:	41A4973	1
French Canadian • MT 4155: • MT 4158: • MT 4218:	41A4974	1

Keyboard - Enhanced Performance	FRU #	CRU
German • MT 4155: • MT 4158: • MT 4218:	41A4975	1
Greek • MT 4155: • MT 4158: • MT 4218:	41A4976	1
Greek/US • MT 4155: • MT 4158: • MT 4218:	41A5078	1
Hebrew • MT 4155: • MT 4158: • MT 4218:	41A4977	1
Hungarian • MT 4155: • MT 4158: • MT 4218:	41A4978	1
Iceland • MT 4155: • MT 4158: • MT 4218:	41A4979	1
Italy • MT 4155: • MT 4158: • MT 4218:	41A4980	1
Japanese • MT 4155: • MT 4158: • MT 4218:	41A4981	1
Korean • MT 4155: • MT 4158: • MT 4218:	41A4982	1
LA Spanish • MT 4155: • MT 4158: • MT 4218:	41A4983	1

Keyboard - Enhanced Performance	FRU #	CRU
Norwegian • MT 4155: • MT 4158: • MT 4218:	41A4984	1
Polish • MT 4155: • MT 4158: • MT 4218:	41A4985	1
Portuguese • MT 4155: • MT 4158: • MT 4218:	41A4986	1
Romanian • MT 4155: • MT 4158: • MT 4218:	41A4987	1
Russian/Cyrillic • MT 4155: • MT 4158: • MT 4218:	41A4988	1
Serbian/Cyrillic • MT 4155: • MT 4158: • MT 4218:	41A4989	1
Slovak • MT 4155: • MT 4158: • MT 4218:	41A4990	1
Spanish • MT 4155: • MT 4158: • MT 4218:	41A4991	1
Swedish/Finnish • MT 4155: • MT 4158: • MT 4218:	41A4992	1
French/German • MT 4155: • MT 4158: • MT 4218:	41A4993	1

Keyboard - Enhanced Performance	FRU #	CRU
Thailand • MT 4155: • MT 4158: • MT 4218:	41A4994	1
Turkish • MT 4155: • MT 4158: • MT 4218:	41A4995	1
Turkish • MT 4155: • MT 4158: • MT 4218:	41A4996	1
UK English • MT 4155: • MT 4158: • MT 4218:	41A4997	1
US European • MT 4155: • MT 4158: • MT 4218:	41A4998	1
Slovenian • MT 4155: • MT 4158: • MT 4218:	41A4999	1

Keyboard - USB Preferred Pro Fingerprint	FRU #	CRU
US English • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0038	1
Arabic • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0039	1
Arabic/French • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0040	1

Keyboard - USB Preferred Pro Fingerprint	FRU #	CRU
Belgium French • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0041	1
Belgium English • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0042	1
Brazilian Portuguese • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0043	1
Bulgarian • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0044	1
Chinese/US • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0045	1
Czech (ABB) • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0046	1
Danish • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0047	1
Dutch • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0048	1
French • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0049	1
French Canadian • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0050	1

Keyboard - USB Preferred Pro Fingerprint	FRU #	CRU
French Canadian • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0051	1
German • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0052	1
Greek • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0053	1
Greek/US • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0054	1
Hebrew • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0055	1
Hungarian • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0056	1
Iceland • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0057	1
Italy • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0058	1
Japanese • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0059	1
Korean • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0060	1

Keyboard - USB Preferred Pro Fingerprint	FRU #	CRU
LA Spanish • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0061	1
Norwegian • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0062	1
Polish • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0063	1
Portuguese • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0064	1
Romanian • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0065	1
Romanian • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0066	1
Russian/Cyrillic • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0067	1
Serbian/Cyrillic • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0068	1
Slovak • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0069	1
Spanish • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0070	1

Keyboard - USB Preferred Pro Fingerprint	FRU #	CRU
Swedish/Finnish • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0071	1
Swiss French/German • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0072	1
Thailand • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0073	1
Turkish • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0074	1
Turkish • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0075	1
UK English • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0076	1
US European • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0077	1
Slovenian • MT 4155: CTO • MT 4158: CTO • MT 4218:	41R0078	1

Mice	FRU #	CRU
Optical mouse (400 DPI), USB - red wheel (Primary) • MT 4155: CTO D1G D4G E7M E1U E1F 93G 88G 89G A2A A2Q A2T F9C E9U E9F F1U F1F G2M G3G G4G G5G G7U G7F G8U G8F G9M H1M H2M H9U H9F J1J J2J J3J J4J J5J J6J J7J J8J J9H K1G K2G K3G K4U K4F K5M K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E F3M F4M F6M C2G C3G C5G C7G C8G D2G C6C F9U F9F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M6J M7J M8J M9J	41U3013	1

Mice	FRU #	CRU
N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N4U N4F N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:		
Optical mouse (400 DPI), USB - red wheel (Secondary) • MT 4155: CTO D1G D4G E7M E1U E1F 93G 88G 89G A2A A2Q A2T F9C E9U E9F F1U F1F G2M G3G G4G G5G G7U G7F G8U G8F G9M H1M H2M H9U H9F J1J J2J J3J J4J J5J J6J J7J J8J J9H K1G K2G K3G K4U K4F K5M K6G K7G • MT 4158: CTO D6U D6F D6S D6L D6D D6Y D6G D6M D6A D6Q D6T D6C D6B D6H D6V D6K D6R D6E F3M F4M F6M C2G C3G C5G C7G C8G D2G C6C F9U F9F H1U H1F H5M H6M H8G H9G J1G J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M3F M4U M4F M5J M6J M7J M8J M9J N1U N1F N1S N1P N1L N1D N1Y N1G N1M N1A N1Q N1T N1C N1B N1H N1V N1K N1R N1E N1J N2U N2F N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J N4U N4F N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41U3030	1
3 Button laser mouse (1600 DPI), USB • MT 4155: CTO • MT 4158: CTO • MT 4218:	41U3078	1
Optical wheel mouse (800 DPI), USB - red wheel • MT 4155: CTO K5M K6G K7G • MT 4158: CTO N5U N5F N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218: CTO	45J4889	1

Adapters and miscellaneous FRUs

Adapters and miscellaneous FRUs	FRU #	CRU
3.5" 20-in-1 media card reader (w/GPIO detect) • MT 4155: CTO • MT 4158: CTO • MT 4218:	45R8139	1
L1 IEEE 1394 PCI adapter • MT 4155: CTO • MT 4158: CTO • MT 4218:	41D2781	1
Speakers (2-piece) Lenovo Logo (Secondary) • MT 4155: CTO • MT 4158: CTO • MT 4218:	41A5334	1

Adapters and miscellaneous FRUs	FRU #	CRU
Lenovo 3 pieces speakers (China only) • MT 4155: CTO • MT 4158: CTO • MT 4218:	45C8640	1
Lenovo 2 pieces speakers (China only) • MT 4155: CTO • MT 4158: CTO • MT 4218:	45C8641	1
Speaker power brick • MT 4155: CTO • MT 4158: CTO • MT 4218:	89P8571	1
256MB NVIDIA NVS290 (DMS59 connector) - Quasar • MT 4155: CTO • MT 4158: CTO • MT 4218:	42Y6329	1
256MB NVIDIA FX380 (DVI + DP) (Hard from 46R2784) • MT 4155: CTO • MT 4158: CTO • MT 4218:	71Y6863	1
512MB NVIDIA FX580 (DVI + DP + DP) • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R2786	1
768MB NVIDIA FX1800 (DVI + DP + DP) • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R2788	1
1.5GB NVIDIA FX4800 (DVI + DP + DP + ST), 2x3 power connector . • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R2792	1
Dual FX4800 SLI enabled • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R2792	1
SLI cable • MT 4155: CTO • MT 4158: CTO • MT 4218:	63Y9163	2

Adapters and miscellaneous FRUs	FRU #	CRU
256MB NVIDIA NVS295 (dual DP) • MT 4155: CTO • MT 4158: CTO J2U J2F • MT 4218:	46R2782	1
1GB NVIDIA FX3800 (DVI + DP + ST), 2x3 power connector • MT 4155: CTO • MT 4158: CTO • MT 4218:	89Y0429	1
4GB NVIDIA FX5800 (DVI + DVI + DP + ST), 2*2X3 power connector • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R2794	1
Dual FX5800 SLI enabled • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R2794	1
256MB ATI FirePro V3700 (dual DVI) • MT 4155: CTO • MT 4158: CTO • MT 4218:	53Y8569	1
512MB ATI FirePro V5700 (DP+DP+DVI) • MT 4155: • MT 4158: CTO • MT 4218:	53Y8571	1
1GB ATI FirePro V7700 (DP+DP+DVI) • MT 4155: CTO • MT 4158: CTO • MT 4218:	53Y8573	1
Soft modem V.90/V.44 • MT 4155: CTO • MT 4158: CTO • MT 4218:	29R9729	1
Dongle cable (DMS59 to dual DVI) • MT 4155: CTO • MT 4158: CTO • MT 4218:	41X6398	1
Nvidia Tesla C1060 compute card (computer adapter) • MT 4155: CTO • MT 4158: CTO • MT 4218:	46R6041	1

Adapters and miscellaneous FRUs	FRU #	CRU
SoundBlaster Titanium audio card (PCIe) • MT 4155: CTO • MT 4158: CTO • MT 4218:	46T0407	1
Modem phone cable • MT 4155: CTO • MT 4158: CTO • MT 4218:	39K5120	1
DVI to VGA dongle • MT 4155: CTO • MT 4158: CTO • MT 4218:	45C7816	1
512MB NVIDIA Quadro NVS 450 GDDR3 (DP+DP+DP+DP) • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y9895	1
Nvidia Quadro 6000, Dual link DVI, DP, DP, Stereo 3D 6GB GDDR5 • MT 4155: CTO • MT 4158: CTO • MT 4218:	89Y8629	1
Nvidia Telsa 2050, 3GB GDDR5 • MT 4155: CTO • MT 4158: CTO • MT 4218:	89Y8630	1
Nvidia Quadro 2000, Dual link DVI, DP, DP, 1GB GDDR5 • MT 4155: E9U E9F G2M G9M J5J J9H • MT 4158: CTO • MT 4218:	89Y8856	1
Nvidia Quadro 4000, Dual link DVI, DP, DP, Stereo 3D 2GB GDDR5 • MT 4155: D7C F9C F1U F1F H1M J1J J2J J3J J6J • MT 4158: CTO F4M F6M C3G C5G F9U F9F H5M H7M H8G J6U J6F J7U J7F J9U J9F K2M K3M K4M K5M K6M K9J L9G M1G M2G M6J N3U N3F N3S N3P N3L N3D N3Y N3G N3M N3A N3Q N3T N3C N3B N3H N3V N3K N3R N3E N3J • MT 4218:	89Y8627	1
Nvidia Quadro 5000, Dual link DVI, DP, DP, Stereo 3D 2.5GB GDDR5 • MT 4155: CTO H2M J8J • MT 4158: CTO C8G C6C H6M J8U J8F K7M L1J L8G M5J M7J M9J N2U N2F N4U N4F • MT 4218:	89Y8628	1

Adapters and miscellaneous FRUs	FRU #	CRU
DP to DVI dongle 200 mm • MT 4155: CTO • MT 4158: CTO D2G H1U H1F J5U J5F K1U K1F K8M M8J • MT 4218:	43N9160	1
Nvidia Quadro 600, Dual link DVI, DP, 1GB GDDR3 • MT 4155: CTO J4J K4U K4F • MT 4158: CTO • MT 4218:	03T8009	1
512MB Nvidia NVS300 (DMS59 connector to dual DVI) • MT 4155: CTO • MT 4158: CTO G7U G7F • MT 4218: CTO	03T8152	1
512MB Nvidia NVS300, PCIe x 1 (DMS59 connector to dual DVI) • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03T8039	1
Nvidia Quadro 400, DVI and DP only, 512MB • MT 4155: CTO H9U H9F • MT 4158: CTO M4U M4F • MT 4218: CTO	03T8040	1
Nvidia Quadro 2000D dual DVI 1 GB GDDR5 • MT 4155: CTO • MT 4158: CTO M3U M3F • MT 4218: CTO	03T8418	1
Nvidia Tesla C2075 (dual link DVI) - 6GB GDDR5 • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03T8365	1

Power Cords

Power Cords	FRU #	CRU
Line Cord - China • MT 4155: CTO D7C F9C • MT 4158: CTO D6C C6C N1C N3C • MT 4218:	41R3256	1
Line Cord - Japan and Japanese English • MT 4155: CTO J1J J2J J3J J4J J5J J6J J7J J8J • MT 4158: CTO D6E M5J M6J M7J M8J M9J N1E N1J N3E N3J • MT 4218:	41R3248	1

Power Cords	FRU #	CRU
Line Cord - Brazil (Portuguese) • MT 4155: CTO • MT 4158: CTO N1P N3P • MT 4218:	41R3270	1
Line Cord - LA High Volt (APU) • MT 4155: CTO • MT 4158: CTO D6Y N1Y N3Y N1L N3L • MT 4218:	41R3176	1
Line Cord - Australia / New Zealand • MT 4155: CTO E7M G2M G9M H1M H2M K5M K6G K7G • MT 4158: CTO F3M F4M F6M H5M H6M K2M K3M K4M K5M K6M K7M K8M N1M N3M N6M N7M N8M • MT 4218:	41R3196	1
Line Cord - Korea • MT 4155: CTO • MT 4158: CTO N1K N1R N3K N3R • MT 4218:	41R3260	1
Line Cord - Hong Kong, UK, Ireland, Singapore, Malaysia, Brunei, Hong Kong • MT 4155: CTO A4H G3G G4G G5G J9H K1G K2G K3G K6G K7G • MT 4158: CTO D6G D6M C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N1A N3A N1B N3B N1H N3H N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41R3224	1
Line Cord - Taiwan • MT 4155: CTO A4V • MT 4158: CTO D6B D6H D6V N1V N3V • MT 4218:	41R3278	1
Line Cord - Italy • MT 4155: CTO K1G K2G K3G K6G K7G • MT 4158: CTO D6S D6Y D6L D6G N1S N3S N1Y N3Y N1L N3L N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41R3232	1
Line Cord - A models • MT 4155: CTO • MT 4158: CTO D6A N1A N3A • MT 4218:	41R3208	1
Line Cord - Denmark • MT 4155: CTO 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO D6G C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41R3212	1

Power Cords	FRU #	CRU
Line Cord - Switzerland • MT 4155: CTO 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO D6G C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41R3228	1
Line Cord - Israel • MT 4155: CTO 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO D6G C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41R3236	1
Line Cord - South Africa • MT 4155: CTO E7M 93G G2M G3G G4G G5G G9M H1M H2M K1G K2G K3G K5M K6G K7G • MT 4158: CTO D6M D6G F3M F4M F6M H5M H6M H7M H8G H9G J1G K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G N1G N3G N1M N3M N1A N3A N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41R3220	1
Line Cord - India • MT 4155: CTO A2Q • MT 4158: CTO N1Q N3Q • MT 4218:	41R3341	1
Line Cord - US (for use on 2P systems only) • MT 4155: CTO K4U K4F • MT 4158: CTO D6U D6F D6S D6L D6D D6A D6T F9U F9F G7U G7F H1U H1F J2U J2F J3U J3F J4U J4F J5U J5F J6U J6F J7U J7F J8U J8F J9U J9F K1U K1F M3U M3F M4U M4F N1U N1F N1S N2U N2F N3U N3F N3S N4U N4F N1D N3D N1L N3L N1A N3A N1T N3T N5U N5F • MT 4218:	45J9502	1
Line Cord - Japan and Japanese English • MT 4155: CTO J1J J2J J3J J4J J5J J6J J7J J8J • MT 4158: CTO D6E M5J M6J M7J M8J M9J N1E N1J N3E N3J • MT 4218:	43N9057	1
Taiwan (for use on 2P systems only) • MT 4155: CTO • MT 4158: CTO D6B D6H D6V N1V N3V • MT 4218:	45J9503	1

Power Cords - Secondary	FRU #	CRU
Line Cord - China • MT 4155: CTO D7C F9C • MT 4158: CTO D6C C6C N1C N3C • MT 4218:	41R3257	1
Line Cord - Japan and Japanese English • MT 4155: CTO J1J J2J J3J J4J J5J J6J J7J J8J • MT 4158: CTO D6E M5J M6J M7J M8J M9J N1E N1J N3E N3J • MT 4218:	41R3249	1
Line Cord - Brazil (Portuguese) • MT 4155: CTO • MT 4158: CTO N1P N3P • MT 4218:	41R3271	1
Line Cord - LA High Volt (APU) • MT 4155: CTO • MT 4158: CTO D6Y N1Y N3Y N1L N3L • MT 4218:	41R3177	1
Line Cord - Australia / New Zealand • MT 4155: CTO E7M G2M G9M H1M H2M K5M • MT 4158: CTO F3M F4M F6M H5M H6M K2M K3M K4M K5M K6M K7M K8M N1M N3M N6M N7M N8M • MT 4218:	41R3197	1
Line Cord - Korea • MT 4155: CTO • MT 4158: CTO N1K N1R N3K N3R • MT 4218:	41R3261	1
Line Cord - Hong Kong, UK, Ireland, Singapore, Malaysia, Brunei, Hong Kong • MT 4155: CTO A4H G3G G4G G5G J9H K1G K2G K3G K6G K7G • MT 4158: CTO D6G D6M C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N1A N3A N1B N3B N1H N3H N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41R3225	1
Line Cord - Taiwan • MT 4155: CTO A4V • MT 4158: CTO D6B D6H D6V N1V N3V • MT 4218:	41R3279	1
Line Cord - Italy • MT 4155: CTO K1G K2G K3G K6G K7G • MT 4158: CTO D6S D6Y D6L D6G N1S N3S N1Y N3Y N1L N3L N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41R3233	1

Power Cords - Secondary	FRU #	CRU
Line Cord - A models • MT 4155: CTO • MT 4158: CTO D6A N1A N3A • MT 4218:	41R3209	1
Line Cord - Denmark • MT 4155: CTO 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO D6G C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41R3213	1
Line Cord - Switzerland • MT 4155: CTO 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO D6G C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G • MT 4218:	41R3229	1
Line Cord - Israel • MT 4155: CTO 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO D6G C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41R3237	1
Line Cord - South Africa • MT 4155: CTO E7M 93G G2M G3G G4G G5G G9M H1M H2M K1G K2G K3G K5M K6G K7G • MT 4158: CTO D6M D6G F3M F4M F6M H5M H6M H7M H8G H9G J1G K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G N1G N3G N1M N3M N1A N3A N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	41R3221	1
Line Cord - India • MT 4155: CTO A2Q • MT 4158: CTO N1Q N3Q • MT 4218:	41R3175	1
Line Cord - Japan and Japanese English • MT 4155: CTO J1J J2J J3J J4J J5J J6J J7J J8J • MT 4158: CTO D6E M5J M6J M7J M8J M9J N1E N1J N3E N3J • MT 4218:	43N9058	1

Recovery discs

Windows XP Professional 64 Mono Recovery CD

Note: The Windows XP Professional recovery DVDs are available only for models with a valid Microsoft Windows XP Professional certificate of authenticity (COA) affixed to the system. Due to a Microsoft licensing limitation, if a model came with Windows XP Professional preinstalled from the factory, but has either a Windows 7 or Windows Vista COA affixed to the system, that model is eligible only for recovery DVDs that match the operating system specified on the COA.

Windows XP Professional 64 Mono	FRU #	CRU
US English • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03W2824	1
Japanese • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03W2825	1

Windows Vista Business 32 Recovery CD

Note: The Windows Vista recovery DVDs are available only for models with a valid Microsoft Windows Vista certificate of authenticity (COA) affixed to the system. Due to a Microsoft licensing limitation, if a model came with Windows Vista Business or Windows Vista Ultimate preinstalled from the factory, but has a Windows 7 COA affixed to the system, that model is eligible only for recovery DVDs that match the operating system specified on the COA.

Windows Vista Business 32	FRU #	CRU
English • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y5661	1
Russian English • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3672	1
French • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3673	1
German • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3674	1
Spanish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3675	1
Brazilian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3676	1

Windows Vista Business 32	FRU #	CRU
Italian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3677	1
Japanese • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y5662	1
Norwegian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3699	1
Swedish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3700	1
Danish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3697	1
Dutch • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3691	1
Czech • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3678	1
Finnish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3698	1
Polish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3679	1
Russian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3680	1

Windows Vista Business 32	FRU #	CRU
Turkish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3681	1
Hungarian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3682	1
Greek • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3683	1
Simplified Chinese • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y5663	1
Traditional Chinese • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3686	1
Traditional Chinese - Hong Kong • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3687	1
Korean • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3688	1
Slovenian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3689	1
Romanian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3693	1
Portuguese • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3694	1

Windows Vista Business 32	FRU #	CRU
Serbian-Latin • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3695	1
Slovakian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3696	1
Arabic Localized • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3690	1
Hebrew • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3692	1
C&L Nordics (EN DK FI NO SV) • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3701	1
C&L Switzerland (EN FR GR IT) • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3702	1
C&L Bel Lux (EN FR GR NL) • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3703	1
English for India • MT 4155: CTO • MT 4158: CTO • MT 4218:	71Y3620	1

Windows Vista Business 64 Recovery CD

Note: The Windows Vista recovery DVDs are available only for models with a valid Microsoft Windows Vista certificate of authenticity (COA) affixed to the system. Due to a Microsoft licensing limitation, if a model came with Windows Vista Business or Windows Vista Ultimate preinstalled from the factory, but has a Windows 7 COA affixed to the system, that model is eligible only for recovery DVDs that match the operating system specified on the COA.

Windows Vista Business 64	FRU #	CRU
English • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y5664	1
Russian English • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3771	1
French • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3772	1
German • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3773	1
Spanish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3774	1
Brazilian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3775	1
Italian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3776	1
Japanese • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y5665	1
Norwegian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3796	1
Swedish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3797	1

Windows Vista Business 64	FRU #	CRU
Danish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3794	1
Dutch • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3790	1
Czech • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3777	1
Finnish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3795	1
Polish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3778	1
Russian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3779	1
Turkish • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3780	1
Hungarian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3781	1
Greek • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3782	1
Simplified Chinese • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y5666	1

Windows Vista Business 64	FRU #	CRU
Traditional Chinese • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3785	1
Traditional Chinese - Hong Kong • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3786	1
Korean • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3787	1
Slovenian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3788	1
Portuguese • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3792	1
Slovakian • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3793	1
Arabic Localized • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3789	1
Hebrew • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3791	1
C&L Nordics (EN DK FI NO SV) • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3798	1

Windows Vista Business 64	FRU #	CRU
C&L Switzerland (EN FR GR IT) • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3799	1
C&L Bel Lux (EN FR GR NL) • MT 4155: CTO • MT 4158: CTO • MT 4218:	64Y3800	1

Windows 7 Professional 64 SP1 Recovery CD

Windows 7 Professional 64 SP1	FRU #	CRU
US English • MT 4155: CTO D1G D4G E7M A4H 93G 88G 89G A2A A2Q E9U F1U G2M G3G G4G G5G G7U G8U G9M H1M H2M H9U J9H K1G K2G K3G K4U K5M K6G K7G • MT 4158: CTO D6U D6G D6M D6A D6Q D6H D6E D6J F3M F4M F6M C2G C3G C5G C7G C8G D2G F9U G7U H1U H5M H6M H7M H8G H9G J1G J2U J3U J4U J5U J6U J7U J8U J9U K1U K2M K3M K4M K5M K6M K7M K8M L5G L6G L7G L8G L9G M1G M2G M3U M4U N1U N2U N3U N4U N1L N3L N1G N3G N1M N1A N1Q N3MN3A N3Q N1T N3T N1H N3H N1R N1E N3R N3E N5U N6M N7M N8M N9G O1G O2G O3G O4G O5G O6G • MT 4218:	03W2908	1
French • MT 4155: CTO D1G D4G E1F 93G 88G 89G E9F F1F G1F G3G G4G G5G G7F G8F H9F K1G K2G K3G K4F K6G K7G • MT 4158: CTO D6F G7F H1F H8G H9G J1G J2F J3F J4F J5F J6F J7F J8F J9F K1F L5G L6G L7G L8G L9G M1G M2G M3F M4F N1F N2F N3F N4F N1G N3G N5F N9G O1G O2G O3G O4G O5G • MT 4218:	03W2890	1
German • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2892	1
Czech • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2888	1
Polish • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2898	1

Windows 7 Professional 64 SP1	FRU #	CRU
Turkish • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2907	1
Greek • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2891	1
Korean • MT 4155: CTO • MT 4158: CTO D6K N1K N3K • MT 4218:	03W2897	1
Slovenian • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2904	1
Russian English • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2900	1
Slovakian • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2903	1
Arabic Localized • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2884	1
Simplified Chinese • MT 4155: CTO D7C F9C • MT 4158: CTO B9C D6C D7C D8C D9C E1C E2C E3C E4C E5C C6C 96C 97C B7C B8C H2C H3C N1C N3C • MT 4218:	03W2886	1
Traditional Chinese • MT 4155: CTO A4V • MT 4158: CTO D6V N1V N3V • MT 4218:	03W2887	1

Windows 7 Professional 64 SP1	FRU #	CRU
India English • MT 4155: CTO • MT 4158: CTO D6Q N1Q N3Q • MT 4218:	03W2889	1
Hong Kong • MT 4155: CTO A4V • MT 4158: CTO D6B N1B N3B • MT 4218:	03W2893	1
Italian • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2895	1
Russian • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2902	1
Spanish • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2905	1
C&L Bel Lux (EN FR GR NL) • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2909	1
C&L Nordics (EN DK FI NO SV) • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2910	1
C&L Switzerland (EN FR GR IT) • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2911	1

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Portuguese • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2899	1
Brazilian Portuguese • MT 4155: CTO • MT 4158: CTO N1P N3P • MT 4218:	03W2885	1
Hungary • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2894	1
Romanian • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2901	1
Serbian-Latin • MT 4155: CTO D1G D4G 93G 88G 89G G3G G4G G5G K1G K2G K3G K6G K7G • MT 4158: CTO C2G C3G C5G C7G C8G D2G H8G H9G J1G L5G L6G L7G L8G L9G M1G M2G N1G N3G N9G O1G O2G O3G O4G O5G • MT 4218:	03W2906	1
Japanese • MT 4155: CTO J1J J2J J3J J4J J5J J6J J7J J8J • MT 4158: CTO M5J M6J M7J M8J M9J N1J N3J • MT 4218:	03W2896	1

Windows 7 Ultimate 64 SP1 Recovery CD

Windows 7 Ultimate 64 SP1	FRU #	CRU
US English • MT 4155: CTO • MT 4158: CTO • MT 4218: CTO	03W2883	1

Chapter 13. Additional Service Information

This chapter provides additional information that the service representative might find helpful.

Security features

Security features in this section include the following:

- Passwords
- Vital Product Data
- Management Information Format (MIF)

Hardware controlled Passwords

Hardware controlled passwords are set using the Setup Utility program. For more information about passwords, see "Using passwords" on page 41.

Operating system password

An operating system password is very similar to a power-on password and denies access to the computer by an unauthorized user when the password is activated. The computer is unusable until the password is entered and recognized by the computer.

Vital product data

Each computer has a unique Vital Product Data (VPD) code stored in the nonvolatile memory on the system board. After you replace the system board, the VPD must be updated. To update the VPD, see "Flash update procedures" on page 251.

BIOS levels

An incorrect level of BIOS can cause false errors and unnecessary FRU replacement. Use the following information to determine the current level of BIOS installed in the computer, the latest BIOS available for the computer, and where to obtain the latest level of BIOS.

- To determine the current Level of BIOS:
  - Start the Setup Utility.
  - Select Standard CMOS Features.
- Sources for obtaining the latest level BIOS available
  1. Lenovo support web site: `http://www.lenovo.com/support/`
  2. Lenovo Customer Support Center
  3. Levels 1 and 2 Support

To update (flash) the BIOS, see "Flash update procedures" on page 251.

Flash update procedures

This section details how to flash (update) the BIOS.

Updating (flashing) BIOS from a disc

This section provides instructions on how to update (flash) BIOS from a disc. System program updates are available at: http://www.lenovo.com/support on the World Wide Web.

1. Make sure the optical drive you want to use is set as the first boot device in the startup device sequence.
2. Make sure the computer is turned on. Insert the disc into the optical drive.
3. Turn off the computer and back on again. The update begins.
4. When prompted to change the serial number, press N.

   Note: If you want to change the serial number, press Y when prompted. Type in the serial number and then press Enter.
5. When prompted to change the machine type/model, press N.

   Note: If you want to change the machine type/model, press Y when prompted. Type in the machine type/model and then press Enter.
6. Follow the instructions on the screen to complete the update.

Updating (flashing) BIOS from the operating system

Note: Because Lenovo makes constant improvements to the Web site, the Web page contents are subject to change without notice, including the contents referenced in the following procedure.

To update (flash) BIOS from your operating system:

1. Go to http://www.lenovo.com/support.
2. Do the following to locate the downloadable files for your machine type:
   a. In the **Enter a product number** field, type your machine type and click Go.
   b. Click **Downloads and drivers**.
   c. Select **BIOS** in the **Refine results** field to easily locate all the BIOS related links.
   d. Click the BIOS update link.
   e. Click the TXT file that contains the instructions for updating (flashing) BIOS from your operating system.
3. Print these instructions. This is very important because they are not on the screen after the download begins.
4. Follow the printed instructions to download, extract, and install the update.

Recovering from a POST/BIOS update failure

If power to your computer is interrupted while POST/BIOS is being updated (flash update), your computer might not restart correctly. If this happens, perform the following procedure commonly called Boot-block Recovery.

1. Turn off the computer and any attached devices, such as printers, monitors, and external drives.
2. Unplug all power cords from electrical outlets, and open the computer cover. See “Removing the cover” on page 78 .
3. Access the system board.
4. Locate the Clear CMOS/Recovery jumper on the system board. See “Locating parts on the system board ” on page 113.
5. Remove any cables that impede access to the Clear CMOS/Recovery jumper.
6. Move the jumper from the standard position (pins 1 and 2) to pins 2 and 3.
7. Reinstall the adapter cards (some models).
8. Close the computer cover and reconnect any cables that were disconnected.

9. Reconnect the power cords for the computer and monitor to electrical outlets.
10. Insert the POST/BIOS update (flash) diskette into drive A, and turn on the computer and the monitor.
11. The recovery session will take two to three minutes. During this time you will hear a series of beeps. After the update session is completed, there will be no video, the series of beeps will end, and the system will automatically turn off. Remove the diskette from the diskette drive.
12. Repeat steps 2 through 5 on page 252.
13. Replace the Clear CMOS/Recovery jumper to its original position.
14. Reinstall the adapter cards (some models) if removed.
15. Close the computer cover and reconnect any cables that were disconnected.
16. Turn on the computer to restart the operating system.

Power management

Power management reduces the power consumption of certain components of the computer such as the system power supply, processor, hard disk drives, and some monitors.

Automatic configuration and power interface (ACPI) BIOS

Being an ACPI BIOS system, the operating system is allowed to control the power management features of the computer and the setting for Advanced Power Management (APM) BIOS mode is ignored. Not all operating systems support ACPI BIOS mode.

Automatic Power-On features

The Automatic Power-On features within the Power Management menu allow you to enable and disable features that turn on the computer automatically.

- **Serial Port A Ring Detect**: With this feature set to **Enabled** and an external modem connected to serial port (COM1), the computer will turn on automatically when a ring is detected on the modem.
- **PCI Modem Ring Detect**: With this feature set to **Enabled**, the computer will turn on automatically when a ring is detected on the internal modem.
- **PCI Wake Up:** This feature allows PCI cards that support this capability to wake the system.
- **Wake Up on Alarm**: You can specify a date and time at which the computer will be turned on automatically. This can be either a single event or a daily event.
- **Wake on LAN**: If the computer has a properly configured token-ring or Ethernet LAN adapter card that is Wake on LAN-enabled and there is remote network management software, you can use the Wake on LAN feature. When you set Wake on LAN to **Enabled**, the computer will turn on when it receives a specific signal from another computer on the local area network (LAN).

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Appendix B. System memory speed

The Intel Xeon microprocessor families compatible with this ThinkStation computer feature an integrated memory controller, which provides the microprocessor with direct access to the system memory. Because of this design, the system memory speed will be determined by a number of factors, including the microprocessor model and the type, speed, size (capacity), and number of DIMMs installed. Refer to the following table for the information on the supported system memory speed for your own computer model.

Table 1. System memory speed

DIMM Type and Speed		PC3-10600U		PC3-8500U
DIMM Size (Capacity)		1 GB, 2 GB, 4GB		1 GB, 2 GB, 4GB
Number of DIMMs Installed		1 to 3	4 to 6	1 to 6
Microprocessor Model	Intel Xeon E5502	800 MHz	800 MHz	800 MHz
	Intel Xeon E5503	800 MHz	800 MHz	800 MHz
	Intel Xeon E5504	800 MHz	800 MHz	800 MHz
	Intel Xeon E5506	800 MHz	800 MHz	800 MHz
	Intel Xeon E5507	800 MHz	800 MHz	800 MHz
	Intel Xeon E5520	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon E5530	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon E5540	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon E5620	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon E5630	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon E5640	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon X5550	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon X5560	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon X5570	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon X5650	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon X5660	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon X5667	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon X5670	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon X5677	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon X5680	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon W3503	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3505	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3520	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3530	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3540	1066 MHz	1066 MHz	1066 MHz

Table 1. System memory speed (continued)

	Intel Xeon W3550	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3565	1066 MHz	1066 MHz	1066 MHz
	Intel Xeon W3570	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon W3580	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon W3680	1333 MHz	1333 MHz	1066 MHz
	Intel Xeon W5580	1333 MHz	1066 MHz	1066 MHz
	Intel Xeon W5590	1333 MHz	1066 MHz	1066 MHz

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